

CTO

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SEVEN DOLLARS



SPECIAL SECTION

Strategic Outlook On Outsourcing: How To Turn A Tough Decision Into A Cloudless Opportunity



AN INTERNATIONAL DATA GROUP PUBLICATION

Southland Corp.'s
Lee Marquardt

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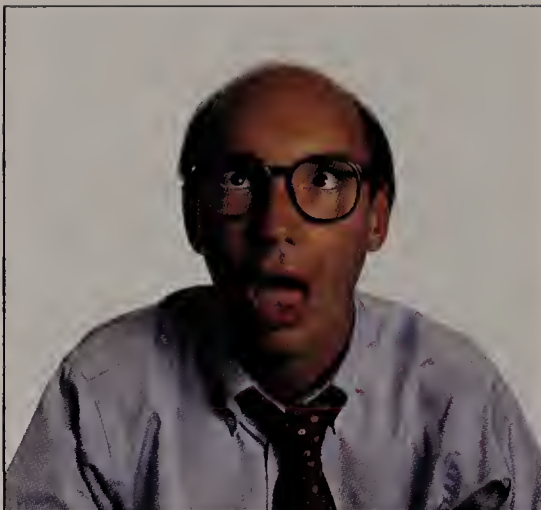
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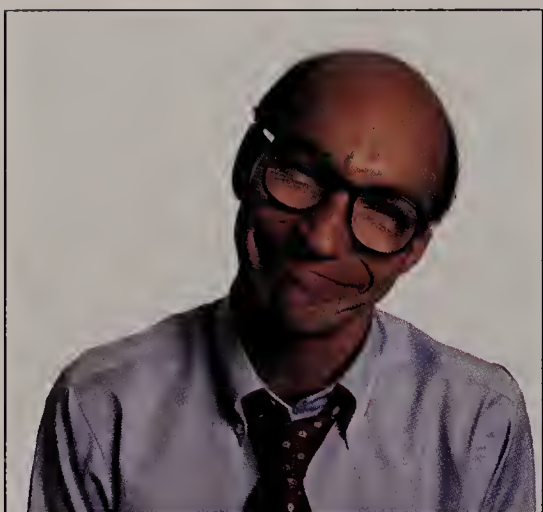
"Hello Mike? What does hard disk failure mean anyway?"



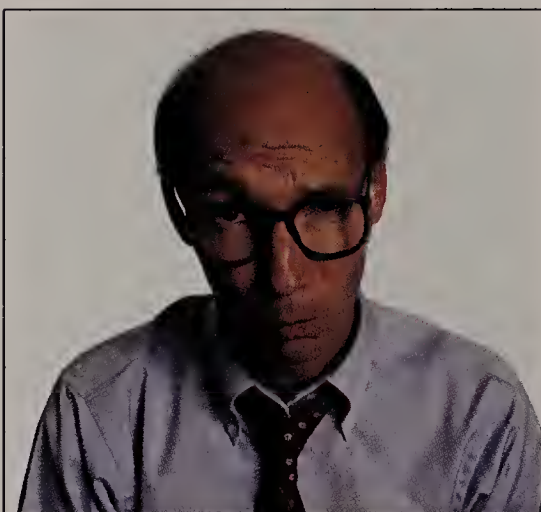
"Mike, we're spending a fortune on these PCs—where is all this money going?!!"



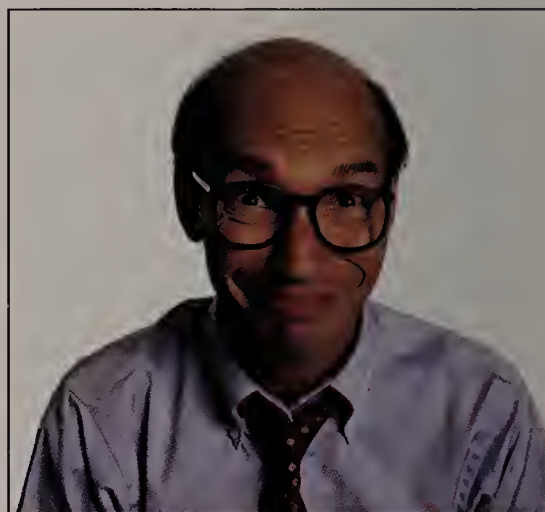
"Hi Mike, can you help me? I can't get on the network."



"I have some questions about this DOS stuff. Gotta minute?"



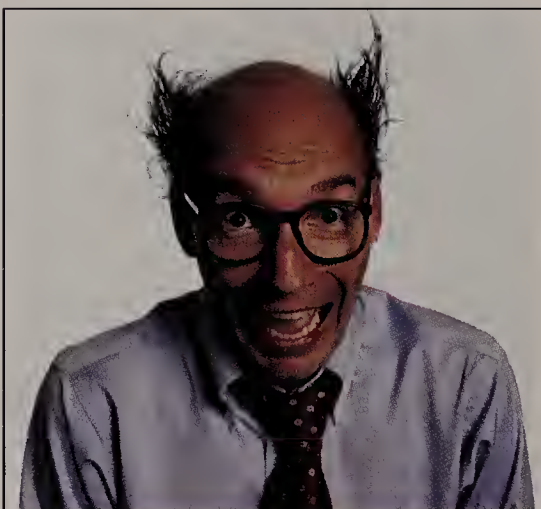
"Quick Mike, I desperately need a color monitor for a big presentation to our CEO!!"



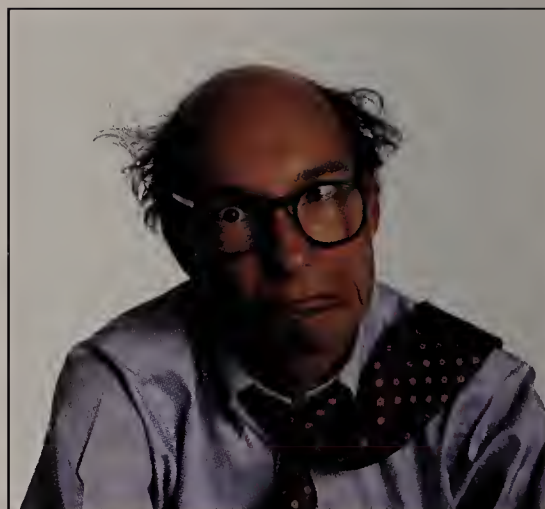
"Hello Mike, sorry, I forgot my password. Again."



"How come they got it and we didn't get it, huh Mike? What's the deal?"



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VOLUME 5, NUMBER 2

STRATEGIC OUTLOOK

OUTSOURCING

The Decision

To outsource or not to outsource: It's a complex question involving issues of money, people and power. And according to some, it's a question that smart CIOs can't afford not to consider.

By Mickey Williamson

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The Vendors

Choosing an outsourcer, like choosing a spouse, should be more than a cosmetic decision. Relationship-minded CIOs should look closely at compatibility and the potential for a long-term alliance.

By Mickey Williamson

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The Shining Example

For those who embark on it rashly, the road to outsourcing is fraught with perils. H.J. Heinz took a cautious, well-thought-out approach, and everything that could go right did.

By Mickey Williamson

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Alma Motorola

Motorola's massive commitment to education and training can teach American business a lesson or two about the connection between skilled workers and a successful corporation.

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M O R E > > >

PERSONAL COMPUTERS

Tandon's Modular Upgradeability

By PETER H. LEWIS

THE Tandon Corporation has become the newest and most enthusiastic proponent of a new trend in personal computers, broadly known as modular upgradeability.

That simply means one can take the microprocessor and related components out of an older computer and replace them with a faster or more powerful set of chips, in effect getting the latest technology for less money than it would cost to buy a complete new system of comparable power.

For computer users who are interested in moving to new generations of software, including the performance-hungry Windows and OS/2 operating systems, upgrades are a very attractive alternative to buying a new machine.

Several other computer makers, including AST Research Inc. and the International Business Machines Corporation, already offer PC models that can be upgraded at the microprocessor level by replacing the main internal circuit board. The new Tandon SL-111 models, which are on display at the PC Expo computer trade show opening today in New York, are unusual in that the components can be replaced without opening the computer case.

The process, Tandon officials said, is similar to inserting a video cassette into a VCR deck. It takes about a minute and requires no tools. Hard disk drives, too, can be plugged in without opening the box. The board-level upgrades offered by other computer companies typically require the user to open the case and perform minor surgery, but even so the process can be completed in less than 10 minutes.

Modular upgrades "simplify the task of coping with very short life cycles of microprocessors," said Bruce Stephen, director of hardware research for the International Data Corporation of Framingham, Mass. "We're in a time when processor technology turns over every nine months or so, so it makes sense to buy a safeguard against obsolescence."

Jim Seymour, a Texas-based computer consultant who advises many large corporations, said, "I don't see any reason not to buy one" of the upgradeable systems. He said upgradeable systems were a trend, not a gimmick.

Mr. Seymour noted that most computer companies do not charge a premium for upgradeable systems or replacement boards, so the user should not face a financial penalty. In addition, the upgradeable computers

Adding advanced components without opening the case insures flexibility.

have many advantages, he said. They simplify design, manufacturing and inventory problems for the computer company. They allow dealers to keep fewer parts in stock. They reduce the need to train workers when new technologies emerge and make it easier to repair and maintain the systems.

Also, because an upgrade cartridge or board can be designed, tested and certified much more quickly than a complete PC system can, new chips can be put into the hands of customers much faster.

Mr. Seymour cited the ability of I.B.M., through a board-level upgrade to the 386-based PS/2 Model 70, to offer its customers the first Intel Corporation i486-based chips on the market last year.

In fact, I.B.M. is so proficient at speeding upgrades to market that earlier this month it announced an Intel i486 50-megahertz upgrade for its PS/2 Models 90 and 95, even though Intel itself did not officially announce the existence of the chip until yesterday.

Only the most power-hungry users really need instant access to the newest technologies. Most upgrade customers, including the ones Tandon is seeking, are likely to be interested mainly in saving money and preventing headaches.

Tandon, of Moorpark, Calif., is best known in this country as a maker of

floppy disk drives; it supplied the ones in the original I.B.M. PC 10 years ago. It began offering full computer systems last year.

"Tandon's SL-111 eliminates the need to buy another computer ever again," Graham Beachum, the head of Tandon's North American operations, said, upgrading the level of hyperbole in the industry.

Tandon's new SL-111 "standard unit" systems have 2 megabytes of working memory, expandable to 32 megabytes; a single diskette drive; seven expansion slots and room for four extra disk drives; a keyboard, mouse and monochrome monitor, and Microsoft DOS and Windows.

The standard unit has a list price of \$895, but that does not include the processor or hard disk, a situation similar to buying a car without an engine or a gas tank. The user can then choose a processor cartridge and storage system based on the level of power that is needed.

A 286 processor operating at 16 megahertz costs \$795. A 20-megahertz 386SX processor costs \$1,165 or \$1,395 depending on whether it has a high-speed data cache system. An i486SX chip running at 20 megahertz is \$1,795, and a full-powered i486 at 33 megahertz is \$2,495.

Tandon offers five different hard disk modules, including an 80-megabyte disk for \$345, a 110-megabyte module for \$535, and a 200-megabyte module for \$725. A "super VGA" color monitor is \$325.

Piecing it all together, one could buy an i486SX-based system with 110 megabytes of storage and a super VGA color monitor for a list price of \$3,550. According to Tandon's plan, a couple of years from now you could pop out the old cartridge, pop in a new one containing Intel's 100-megahertz version of the i586 chip (or something like that), and be on your way.



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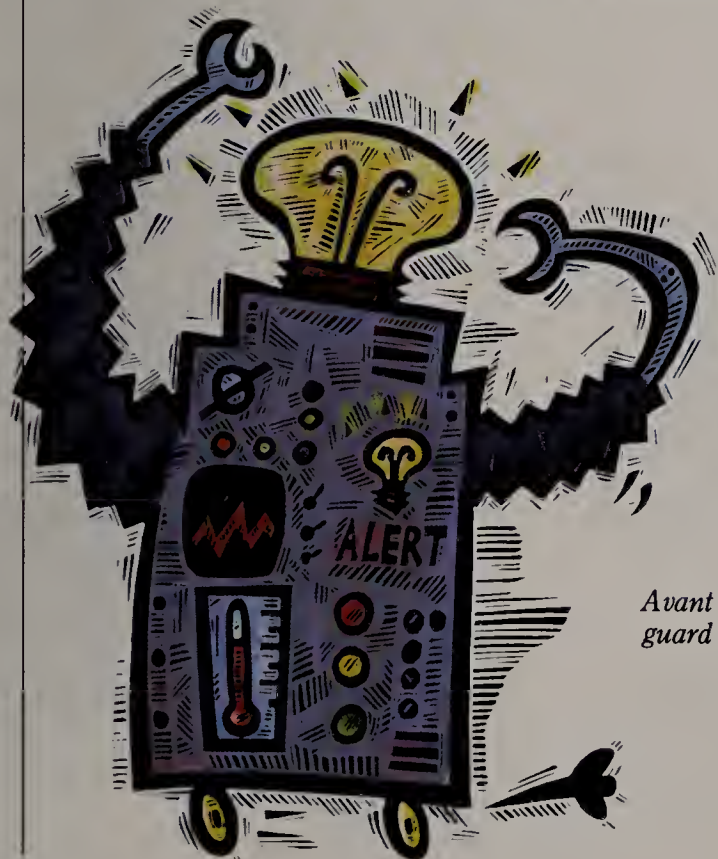
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Venkat (Vinnie) Tiruvilumala
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SONY Corporation



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Mogens Sorensen
Chief Consultant
Nykredit (Denmark)



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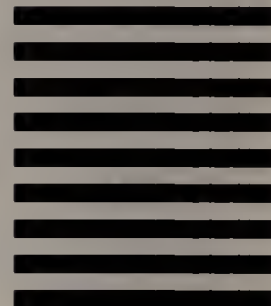
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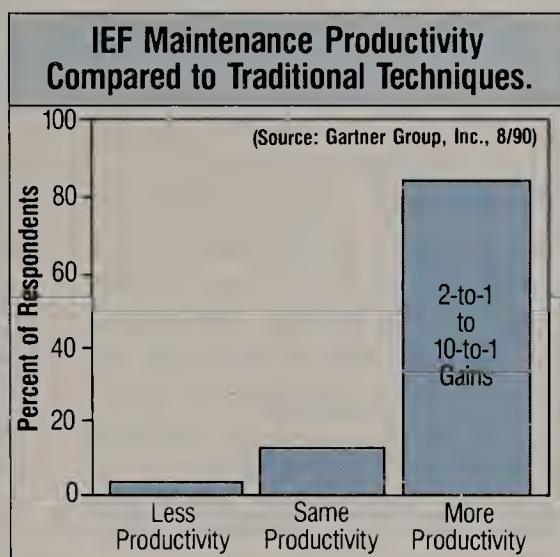
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Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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Outsourcing is a topic that has shown plenty of staying power in its ability to skyrocket the blood pressure of information executives. Two years ago CIOs grappled to understand the outsourcing phenomenon. Emotions ran high; the whole process was extremely threatening. But in the present tight-dollar economy, more and more companies are choosing some form or degree of outsourcing. CIOs approach the issue more rationally than in the past and are generally much more in control of the outsourcing decision.

Our Strategic Outlook, beginning on Page 23, provides a broad perspective on outsourcing. In our articles this month, Contributing Writer

Mickey Williamson focuses on the decision to outsource, the selection of vendors and the structure of the contract. We've included, as well, a few anonymous horror stories just to keep you on your toes. A brief profile of the H.J. Heinz Co. rounds out the package. Heinz's strategy was to optimize its IT investment and share resources by not only centralizing the data centers of its five North American companies but also outsourcing those operations.

In making the decision to outsource, CIOs factor in a variety of strategic considerations. In the past, cost-cutting has been the major determinant in the outsourcing decision. But these days other factors play an increasingly prominent role. Some companies are looking for more flexibility than their current MIS operations can provide; others are seeking to offload IS operations as they concentrate on downsizing new applications.

In making the decision to outsource, it is vital that CIOs assess the performance of their in-house operations, measuring what the in-house group does strategically and cost-effectively, and leveraging those strengths against the outsourcer's strong points. Today you don't have to give away the farm to outsource.

Now that CIOs have become more attuned to the outsourcing arena, vendors are devising ever more clever ways of packaging their services—for example, offering to sell one customer's proprietary systems to other customers on a royalty basis. CIOs need to be aware of the motivations of outsourcers and balance the dynamics of the outsourcing market with in-house requirements.

Whatever the outsourcer's marketing approach, CIOs and experts agree that an absolutely essential part of the evaluation process involves coming away with the confidence that the outsourcer is strong enough financially to remain in business for the duration of your contract.

The decision to outsource is regarded by most as irrevocable. So it is essential for the CIO to head up the team that evaluates this prospect.

Marcia Blumenthal



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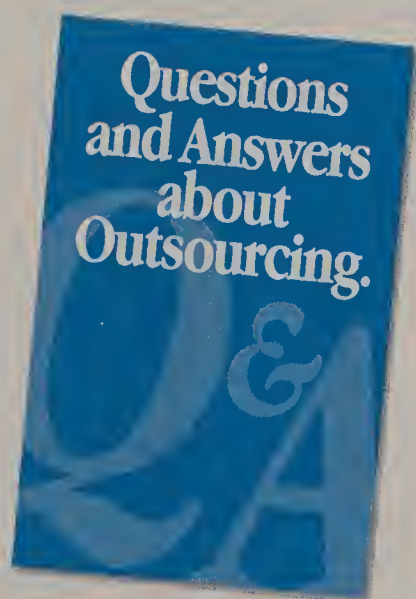
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"The decision to outsource or not is the second decision you ought to make. The first is whether to evaluate it. In my opinion, everybody ought to do that, because it makes you take a hard look at yourself."

—Raymond S. Perry
Vice President and CIO
Avon Products Inc.



As this issue of *CIO* reports, the debate over whether or not to outsource certain IS functions or entire IS operations seems to be cooling off. As IS and other departmental executives come under increasing pressure to contain costs and manage head count, there is a growing trend toward viewing outsourcing as a viable method for achieving both IS and corporate objectives.

A year ago, many CIOs hedged on the outsourcing issue. Some simply dismissed it as an unrealistic business alternative. Others, fearing loss of status and control, vehemently opposed it, refusing to look at the potential benefits outsourcing can provide.

Today's savvy CIOs recognize that outsourcing must be examined as part of an overall IT strategic-planning process. In my opinion, the evaluation of what, why, when and how to outsource is best driven by CIOs. Those who fail to lead the charge may be told to do so by their bosses. In this scenario, the CIO risks losing significant control over the IS organization's destiny.

This issue provides guidance and the latest thinking on outsourcing through the experiences of those who've implemented a range of outsourcing strategies for varying business reasons. Enjoy it.

Walter L. Woz

Coming In CIO

Strategic Outlook: Managing Change

CIO's exploration of how companies handle significant change includes profiles of Continental Bank Corp., which has transformed itself from a full-service bank to a specialized financial institution; Tellabs Inc., whose embracing of JIT and TQM necessitated a reforming of the corporate culture; and CompuCom Systems, which treated efficiency problems by revamping its distribution process.

Concurrent Events

In manufacturing companies, concurrent engineering speeds the journey of products from idea to finished reality. Where does the CIO stand in this new process? In many cases, he or she stands in the background, helping but not directing.

Leading the Way

Tradition has it that top executives and computers don't mix, whether it is because CEOs view computers as merely an administrative tool or because they are simply unwilling to type. But some corporate leaders have found such tools as spreadsheets and word processing to be indispensable to achieving their personal and business goals.



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TRENDLINES

BANKING INDUSTRY

THE MORE THE SCARIER

Given the current state of their industry, bank CIOs don't need more bad news. But a new study conducted by Ernst & Young for the daily trade publication *American Banker* should have them fingering their worry beads. In a survey of 57 of the nation's largest banks—which account for 25 percent of the entire industry's technology spending—Ernst & Young uncovered some hard numbers for banking overcapacity and provided a glimpse of the continued pressure technology spending will exert on banking profits.

The total value of the banking industry's hardware and software investment is about \$200 billion, estimates Ernst & Young—which is about equal to the industry's capital. Bankers have stockpiled approximately 1 million pieces of computer information for every man, woman and child in the nation.



The industry may not need more capacity, but banks don't seem in a hurry to apply the brakes. By 1993 Ernst & Young expects that 92 percent of the industry will replace a core application subsystem, and that over 70 percent of all bank-owned buildings will have local area networks and file servers. Image-processing installations will grow in number from 100 to nearly 1,200, and 30 to 35 percent of the industry will use CASE technology for new development. Banks have purchased about 650,000 personal computers since 1982; by 1995 there should be one PC for every employee in the industry.

One of the surprises of the

survey, according to Diogo Teixeira, the Ernst & Young partner who led the survey team, "is that the movement by banks to client/server is greater than we had anticipated." About 77 percent of the industry will have at least one major transaction-processing application running on client/server technology by 1993, he noted.

But some banks will gorge more MIPS than others. According to the survey, banks with high stock prices expect to grow their data-center capacity by 100 percent per year, while banks with low stock prices estimate their capacity will grow 25 percent to 50 percent per year. The more prosperous banks anticipate that their processing staff will expand 28 percent over the next three years, but during this same time the industry as a whole will trim about 6,000 data-processing employees from the payroll.

As for cost cutting, Brian Tracy, news editor of *American Banker*, noted that survey respondents cited a preference for short-term measures to cut costs (such as employing fewer consultants or trimming DP staff and maintenance costs), over such long-term cost-cutting strategies as consolidating data centers or downsizing platforms.

On second thought, maybe the worry beads ought to be in the hands of bank CEOs instead.

SINGLE-USER APPLICATIONS

We can't prove this from our own experience, but players of the many card games known collectively as solitaire often claim that there is something restful and Zen-like in the sound of one hand playing.

Now that one hand can be dealt electronically. SWFTE International Ltd., a software company in Hockessin, Del., has teamed up with the U.S. Playing Card Co., makers of Bicycle brand playing cards, to offer a DOS-based computer solitaire game. The package, which retails for \$39.95, is actually a suite of seven games: Klondike, Canfield, Calculation, Golf,



Auld Lang Syne, Four Seasons and Little Spider. The package also includes a deck of real Bicycle cards, as well as a book that details the rules and strategy for an additional 150 solitaire games.

A human-resources objective might be served in enabling your stressed-out programmer-analysts to take a rejuvenating Klondike break between JAD sessions. As for multiuser applications, SWFTE says it is working on cribbage and poker editions.

JAPAN BASHING

A controversial study commissioned by the CIA labels Japan a prejudiced, amoral nation single-mindedly bent on global economic domination. First leaked to the press in midsummer, the study by U.S. academics and business leaders raises warning flags that Western independence, power and influence are threatened by a Japan seeking power through wealth.

The study, entitled "Japan: 2000," says Japan's strategy for expanding its economic power is based on protecting its domestic market from foreign penetration and capturing as much of its competitors' market share as possible. It also cited Japan for racial discrimination, indifference toward global welfare and lack of democratic and moral constraints.

"Japan: 2000" takes a dim view of the U.S. as well, faulting its lack of national economic and technology strategies and blaming antitrust laws for impairing U.S. companies' ability to compete globally.

TRENDLINES

UPPER-CRUST CLONES

A new class of "clone nobility" may be the answer to organizations' need for lower-cost PCs, according to a report from Forrester Research Inc., of Cambridge, Mass. The report, which is based on interviews with 54 Fortune 1,000 firms, reveals that the use of non-IBM and -Compaq PCs is on the rise in large companies, with clones accounting for 47 percent of all PC purchases in 1991.

The new tier of vendors differs from the "clone masses" in three significant ways, according to Forrester. The companies are able to provide a high level of service, they do their R&D in-house, and they have a stable financial history. Forrester expects that while many companies will keep IBM as their high-end vendor, they will likely replace Compaq with a low-cost alternative such as AST, Dell or CompuAdd. ■

AUTO ASSEMBLY

NEW MUSCLE FOR BODYBUILDING

Nissan Motor Co. has achieved something that dieters everywhere can only dream about—a quick and easy path to a new body.

The company's new Intelligent Body Assembly System (IBAS) will dramatically reduce the time and cost required for model changes by improving the flexibility of the body-assembly process. IBAS replaces the jigs that hold steel panels together during the initial welding of the body shell with a computer-controlled jig that can be instantly programmed to accommodate any of the vehicles in Nissan's line.

"To introduce a completely new model into this system will take four to six weeks, whereas with the conventional system it would take about a year," said Emil Hassan, vice president of operations at Nissan's Smyrna, Tenn., facility. "It's all done with software. You just load in your new pa-



rameters on the computer."

Because IBAS allows Nissan to build as many as eight different body styles on an assembly line, the company can easily shift the production of different models among various plants. This allows Nissan to be more flexible than other automakers in responding to the market; underutilized facilities can be quickly turned

over to the manufacture of popular models.

The system also uses sensors to measure 60 critical dimensions of each auto body after the initial welding. If any do not conform to specifications, the system is quickly adjusted. "In the past, to measure all those points you'd have to take the body off the line, and it would take two or three hours," said Hassan. "This way we will be doing about 40 an hour. It reaffirms the dimensional integrity of every body."

As a further advantage, IBAS allows production to be simulated on a computer, so potential problems can be worked out before body design is even finalized.

Nissan spent years developing the IBAS software, which is already being employed with considerable success in Japan. Hassan says the Smyrna plant will use the intelligent system beginning in 1992.

"At the beginning our people were a little afraid of how sophisticated and complicated the system is," Hassan said. But after a period of training in Japan, "they think it's fantastic." ■

NEW! IMPROVED! MONEY!

Everyone worries about money, but no one worries about it quite the way the U.S. Department of the Treasury does. It's Treasury, after all, that prints the stuff. Thus it falls to the minions of Treasury Secretary Nicholas F. Brady to assure free-spending citizens that the money supply is, well, safe.

Not safe from economic calamity (though with much of the U.S. money supply now held outside national borders, who can say?), but safe from increasingly sophisticated counterfeiting techniques. Treasury has recently upgraded U.S. currency to incorporate some new counterfeiter-defeating enhancements. In addition to the telltale tiny red and blue fibers embedded in the paper on honest money, \$100 and \$50 bills will soon have woven in a polyes-

ter strip (saying either "USA 100" or "USA 50") that is not reproducible by photocopiers. Both denominations will also partially encircle the portraits on the bills with microprinting ("THE UNITED STATES OF AMERICA") legible only through a magnifying glass, and thus also not reproducible. Denominations of lower value (with the exception of \$1 bills, which Treasury does not regard as significantly at risk for counterfeiting) will get the new security features over the next five years in descending order of value.

Apparently, a high tide doesn't lift all boats: The changes are made necessary by increasingly capable printer and copier technology, which is a tribute to printer and copier makers but a threat to the Federal Reserve. ■

TRENDLINES

LAN SURVEY

WILLING BUT WEAK

Pity the poor LAN administrator. In a recent study on PC LANs, the Business Research Group (BRG), of Newton, Mass., found that companies are anxious to develop critical business applications to run on LANS even though the tools and expertise to do the job are lacking. Network managers are caught in the squeeze.

The study, "PC LAN Integration and Management: User Trends," is based on over 400 telephone interviews with LAN administrators at mid-sized and Fortune 500 companies. Questions focused on needed support services, tools, applications under development, services, perceptions of vendors, future buying intentions and a variety of other issues.

"We have found some really aggressive moves toward client/server computing among some of the larger accounts," said Kevin O'Neill, vice president of network research and consulting at BRG, citing responses to this survey and to other surveys BRG has conducted. "In many cases they are looking to implement critical business applications on the LANs." (Nearly three out of four respondents strongly agreed with the statement, "PC LAN applications are becoming more critical, so the reliability of our servers is a major concern." An additional 21 percent said they somewhat agree.)

But O'Neill added that the "cart is getting ahead of the horse. People seem to be driven to do applications before they put into place all the infrastructural issues." Over 90 percent of the respondents cited internetworking as an important component of their

IS strategy, and 35 percent said the lack of expertise hindered their efforts. About 63 percent said they do not have a LAN management package. Respondents also cited the need for better network administration and security tools.

LAN administrators are feeling the heat. "They're not just laser-printer jockeys anymore," said O'Neill. "They are finding their skill set strapped to the limit, and they are barraged with a lot of alternatives on how they should solve this problem. They're trying to take on the challenges of these new applications and, at the same time, trying to tie their PC LAN into the larger enterprise network. If you're a LAN administrator, it's a difficult position to be in right now." ■

CAREER MOVES

Saint Thomas Hospital of Nashville, Tenn., has named **MELODIE MAYBERRY-STEWART** its new vice president/chief information officer.

Mayberry-Stewart comes to Saint Thomas from the VP/CIO post at Riverside Health Corp. of Riverside, Calif. She holds an MBA from Pepperdine University and master's degrees from the University of Nebraska and the Peter F. Drucker Management Center at Claremont Graduate School. Mayberry-Stewart will coordinate and supervise the hospital's IS and telecommunications functions.

SUSAN F. SCHWAB has been promoted to vice president for IS at Bentley College in Waltham, Mass. Schwab, who joined Bentley in 1987, has been in the IS field for 17 years, most recently as Bentley's director of administrative systems. She has been instrumental in the college's ongoing resystemization effort. In her new job, she will be responsible for Bentley's academic and administrative systems and telecommunications. IS is also heavily involved in Bentley's seven-year-old program of providing all undergraduates with portable computers and integrating computer technology throughout the curriculum. ■

A 21ST CENTURY SENTRY

Remember how safe those intergalactic castaways from *Lost in Space* always felt when their bubble-topped robot was patrolling the ship? Soon earth dwellers will be able to get that same sense of security from Scout-About, a home robot-security system from Samsung Electronics.

The Scout-About navigates around a home or other territory, stopping periodically to monitor an area with a 30-foot radius. Using an ultrasonic and passive infrared sensory system, the robot can detect body heat, motion, the shattering of glass, and air temperatures below 40 degrees or above 100 degrees. If the robot detects a breach in security, it sounds an audible alarm and alerts an automatic dialer, which tells a central monitoring station to call the authorities. Scout-About can also be used to monitor a baby's cries in a nursery or in conjunction with a medical-alert pendant.

According to Samsung, robots are distinguished from mere machines by their "intelligence": They have the capacity to learn and modify characteristic behavior and the facilities to analyze data and perceive the environment.

Unlike such familiar figures as the Jetsons' maid,



Rosie, or C3PO from *Star Wars*, robots need not be humanoid in shape. Scout-About, for example, resembles the top part of a motorcycle helmet.

Most home robots developed to date have cost upwards of \$3,000. Scout-About should be available in March of 1992 at a cost of approximately \$1,500. ■

ILLUSTRATION BY FRAN O'NEILL

TRENDLINES

SIM AWARDS

PROFITABLE PARTNERSHIPS

The Society for Information Management presents its annual Partnership in Leadership Award to senior business and IS executives who have worked together to provide innovative business solutions using information technology. No one better exemplifies the success of such teamwork than this year's recipients, who have proven that IT can be instrumental in helping their companies prosper even while their industries are struggling.

In 1985 the San Francisco-based Bank of America was living an IT nightmare. How could the data-processing department improve customer service and the cost-effectiveness of employees at hundreds of branches with equipment that was falling apart? The solution, an online automation system known as COIN (Customer Online Information Network), entailed building a massive new data network. This ultimately involved integrating 21 million previously separate accounts, installing more than 20,000 PCs and linking them with LANs, writing 6,000 software programs and training 18,000 employees. Spearheading this Herculean effort were Larry McNabb, the executive vice president of the Retail Banking Division, and Bruce Fadem, the senior vice president of Retail/Corporate Automation Services.

When COIN was being con-

ceptualized, no comparable online system existed in the banking industry. Even vendors weren't offering flexible solutions that met the bank's needs. "We wanted to build a system that would serve the organization in the long term," Fadem said.

Consequently, the very nature of the project necessitated a new partnership between the technology and business sides. "Because there was no simple answer," Fadem said, "we had to come together and mutually explore and agree upon the solution."

The benefits Fadem and McNabb anticipated were quickly realized after COIN began full operation in 1989. Many routine tasks formerly done by hand are now automated, resulting in increased employee productivity. COIN now handles 1.5 million transactions daily and is used to open 150,000 customer accounts each month. In addition, the cost of opening and maintaining new accounts has been significantly reduced. Customers can easily perform checking, savings, time-deposit and other transactions, and can even be issued an ATM card on the spot.

Although COIN certainly



LEADING PAIRS: The forces behind Bank of America's COIN system, **LARRY McNABB** (top left), and **BRUCE FADEM** (top right), rescued that institution from an IT nightmare. American Airlines' **MAX D. HOPPER** credits Chairman Robert Crandall for his support of *Interact*, a corporate-wide information platform.



had its rough spots, Fadem never doubted its eventual success, and he credits McNabb with providing a lot of moral support. "Larry didn't panic or overreact when things didn't go as well as planned," Fadem said. "He knew that good people would work their way through it."

The other two executives honored by SIM are longtime collaborators from American Airlines Inc. of Dallas. When Chairman Robert L. Crandall wanted to realize his vision of a paperless office environment for American, he naturally enlisted the expertise of Vice President of Information Systems Max D. Hopper. The result was *Interact*, a corporate-wide information platform designed to automate and integrate intelligent workstations.

According to Hopper, American is a relative newcomer to office automation. "We held off using PCs on a wide scale in the general office environment because we didn't think it was as easy as

claimed, and all the tools to access standard databases weren't there yet," he said. *Interact* became a viable project only after internal studies revealed both a need for and the economic benefits of office automation.

Interact is being implemented for groups that demonstrate the need and the willingness to support it. Users, who range from secretaries to managers, have access to a variety of applications including word processing, databases and E-mail. At the locations where it has been installed, *Interact* has reduced costs by eliminating the need for multiple terminals and duplicate networks.

Hopper feels that maintaining long-term flexibility is an ongoing challenge that *Interact* will facilitate. "This platform will evolve forever by becoming the front end of any application system built within the company," he said.

Hopper identifies Crandall as the project's driving force. "If it weren't for Bob Crandall, we wouldn't have *Interact*," he said. "He was quite supportive when I was willing to go forward . . . and he has been a good critic." The key to any successful partnership, Hopper added, "is constantly finding someone to challenge you to do more and more."

All four executives were formally honored earlier this month at SIM's annual conference in Chicago. ■

CORRECTION

A "Career Moves" item in the August issue of *CIO* incorrectly identified the previous employer of new Manville Corp. vice president and *CIO* Clifford R. Hall. Hall joined Manville from United Telecommunications Inc., the parent company of US Sprint. *CIO* regrets the error. ■

Switching Channels

The move toward enterprisewide computing is forcing CIOs to seize control of software distribution by building new channels between the central organization and end users

BY MARY MARGARET GIBSON

We all remember the old days. MIS operated only from data centers, and users were tied by the coax umbilical cord to the host. The minicomputer and PC revolution changed everything; users got computers and departmental budgets to purchase them directly. Fortune 1,000 organizations watched centralized control dissipate as budgets throughout the company absorbed dollars for computing power.

This move toward ever-more-distributed or enterprisewide computing has resulted in CIOs becoming CDOs—chief distribution officers—for their companies. A recent survey and focus-group study conducted by Channel Strategies Inc. (CSI), a distribution-channel consulting firm, further examined the emergence of internal distribution channels and discussed methodologies involved in creating such new channels. These

focus groups, conducted in six cities with CIOs from educational institutions, Fortune 1,000 firms and major private companies, verified that new internal distribution channels built by CIOs resemble those found in traditional commercial distribution organizations.

Existing distribution channels solve few of the problems facing today's CIO. PC software licensing, for example, is a serious problem. A piece of software may be purchased by an individual employee and installed on his or her office computer. That same software may be part of a site license for a division of the company, or it may be purchased in multiple copies in a volume agreement with a national distributor.

The result: many people buying from many sources and probably spending money needlessly. Channels do a very effective job of making product available—that's what they were designed to do. But there is no one source to answer simple questions regarding software versions, upgrades and the legality of the copies.

Most CIOs can't measure the scope of the problem without costly audits of every hard disk in the company. No vendor can tell the CIO which licenses are held by which employees, because license registration for packaged software may be individually obtained. Yet liability for pirated copies is corporate liability. What is needed is centralized control and enterprise licenses for software.

The need to gain leverage through volume purchasing, establishment of requirements for corporatewide technical support with limited resources, and selection of enterprisewide networking strategies also dictate decisions at the corporate level. CIOs "are paying the price for all the freedom everyone has had," said one



ILLUSTRATION BY VICTORIA KANN

study participant, "and now we are going to have to pay more to get the control we need to make the enterprise work as a whole."

CIOs don't think of their activities as "channel building" but rather as "regaining control" and "getting volume deals." In reality they are duplicating distribution-channel structures inside their companies.

CIOs are trying various models for building internal distribution channels. Basic common denominators include lists of approved products for purchase and use, an inventory database to register licenses and equipment to a specific person or facility, and specific products adopted for support by the help desk and IS personnel. Beyond these, CIOs look at their individual company needs to determine the best way of buying from the vendor, performing various operations to prepare software and hardware for use by their customers, and delivering, configuring and installing systems for the end user.

Depending on their specific internal distribution needs, many CIOs are testing these types of distribution models.

Retail model: Commonly used by universities, the bookstore or computer-store model is at work in other types of companies as well. Employees purchase software through a system of chargebacks. Services offered through this model are usually administered by the help desk but may be handled by store employees.

Systems integration: This is the typical method employed for volume purchasing of multiuser software, hardware and PC LANs. Often a third party is brought in as a consultant or to aid in the installation.

Networks and diskless workstations: Some CIOs are opting for diskless workstations tied to LANs to help control the PC software problem. Absolute control of the server eliminates copying problems and simplifies distribution of software and upgrades. The environment is certainly familiar; it looks like the old days.

Distributor: One participant in the CSI study described what is in effect a distribution company inside his organization that sends a quarterly catalog to users. "Once the equip-

Development of profitable distribution channels demands that CIOs focus on a variety of issues formerly handled by vendors and outside distributors.

ment is approved for purchase, we have all of it delivered to the end-user computing group, where we have specialists whose job function is to set it up, burn it in, configure it, run diagnostics on it, load the software the user selected, hook it into the network, and deliver it out to the end-user area, whether it's local or geographically dispersed. We deliver it. That's how we manage it."

Software distribution tools: Today CIOs do have new tools for software distribution, particularly software that manages distribution and electronic version control. These tools, and new ones created for CIOs, will improve the operation of the internal channel.

Channel development plans: Proven channel-building processes and principles have been developed for the computer industry. These can be adapted for use within corporations. The best channels are built according to a phased plan, much like product development, with management built into each step.

New service methods: CIOs must work with vendors to describe scenarios for future service and support. Vendors need to offer support to the CIO's new distribution organization in the same way that they now support value-added resellers or distributors.

Revised software-licensing agreements: Vendors and CIOs should approach license renewal ready to determine fair compensation for the vendor and protection for the CIO. When asked which software license type was best, CIOs overwhelmingly chose the "enterprise license."

"We don't mind paying for an enterprise license," said one CIO, "but

we can't even get most vendors to discuss it."

Relationship management: CIOs are finally appointing vendor-relationship managers who are empowered to make decisions regarding "most-favored status" for vendors. Vendors must deal with large companies as partners, in the same way they deal with resellers today, because the CIO is a reseller, not just a major end-user account. The scope of account management must be enlarged.

Multichannel agreements: Some CIOs want to buy equipment from a vendor under a single volume contract, have equipment delivered through a CIO-selected national distributor who provides fulfillment and reporting functions, secure local support from a third party, and pay for service on a time-and-materials basis or annual-usage agreement. No current vendor/reseller agreements exist that incorporate all these relationships into a multichannel agreement. Channel organizations at major vendor companies should consider multichannel agreements for major corporations.

CIOs are resourceful. They have begun to build internal channels with little outside help. But good channel planning and a cooperative relationship between vendors and IS executives would go far toward making internal channels function. CIOs should request a meeting at which they can describe their distribution challenges and ask for their vendors' help.

Next time the vendor's major account rep offers a contract that seems out of touch with what is needed, the CIO should ask to see a distributor, value-added-reseller or systems-integrator agreement instead. One of them might just fill the bill perfectly. ☐☐

Mary Margaret Gibson is a cofounder and senior partner of Channel Strategies Inc., a distribution channel consultancy in Palo Alto, Calif. She was a keynote speaker at the March 1991 CIO Conference sponsored by CIO Magazine. The complete report, "How CIOs Want to Buy and License Software in the Future," is available from Channel Strategies, 415 324-2720.



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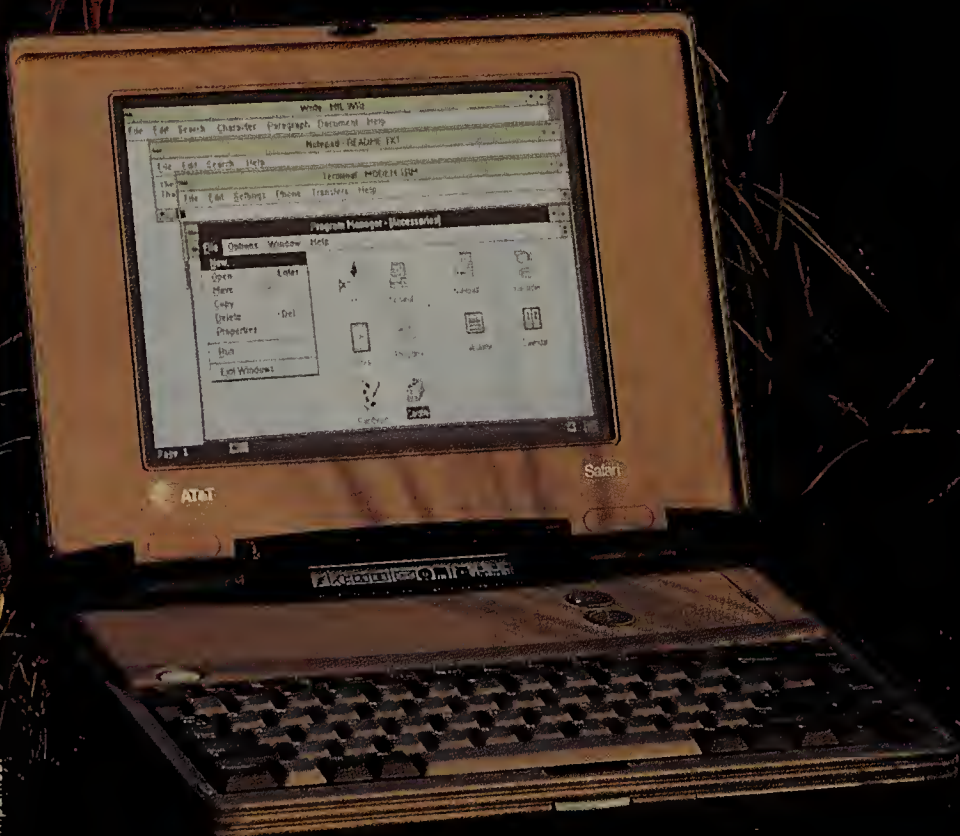
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OUTSOURCING

A SURVIVAL GUIDE

It's a momentous step to entrust a function—even a piece of a function—to the care and kindness of strangers. Thus CIOs, along with those they report to and those who report to them, must never underestimate the complexity and the possible irrevocability of a journey into outsourcing. In the articles that follow, Contributing Writer Mickey Williamson illuminates key aspects of relationships so crucial that they can make or break careers.



THE DECISION

Whether "to outsource or not is the second decision you ought to make," says Avon's Ray Perry. "The first is whether to evaluate it. In my opinion, everybody ought to do that, because it makes you take a hard look at yourself."

PAGE 24

THE PITFALLS

The beauty of someone else's misfortune is (1) that it isn't yours and (2) that you can learn from it.

PAGE 34

THE VENDORS

You'll want assurances that the vendor has the financial capacity not only to stay in business for the life of your contract, but also to provide ample resources to support your applications during that time.

PAGE 38

THE CONTRACT

Drawing up a thorough, foresightful outsourcing contract is "an area where most IS people are really impoverished in their knowledge," says Ralph Lof-tin.

PAGE 40

THE SHINING EXAMPLE

When H.J. Heinz Co. outsourced its five data centers, the over-the-weekend divestiture flowed as smoothly as—though considerably more quickly than—the company's famous "slow" ketchup.

PAGE 44

OUTSOURCING

THE DECISION

To outsource or not to outsource: It's a complex question involving issues of money, people and power. And according to some, it's a question that smart CIOs can't afford not to consider.

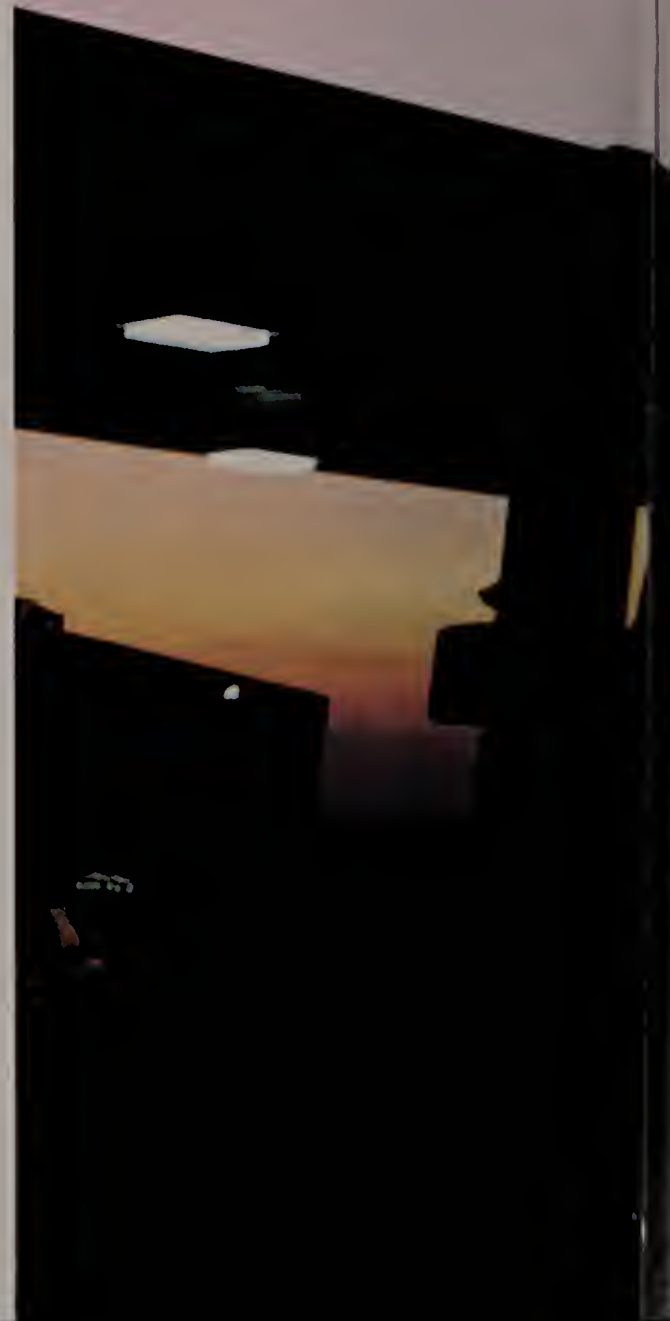
BY MICKEY WILLIAMSON

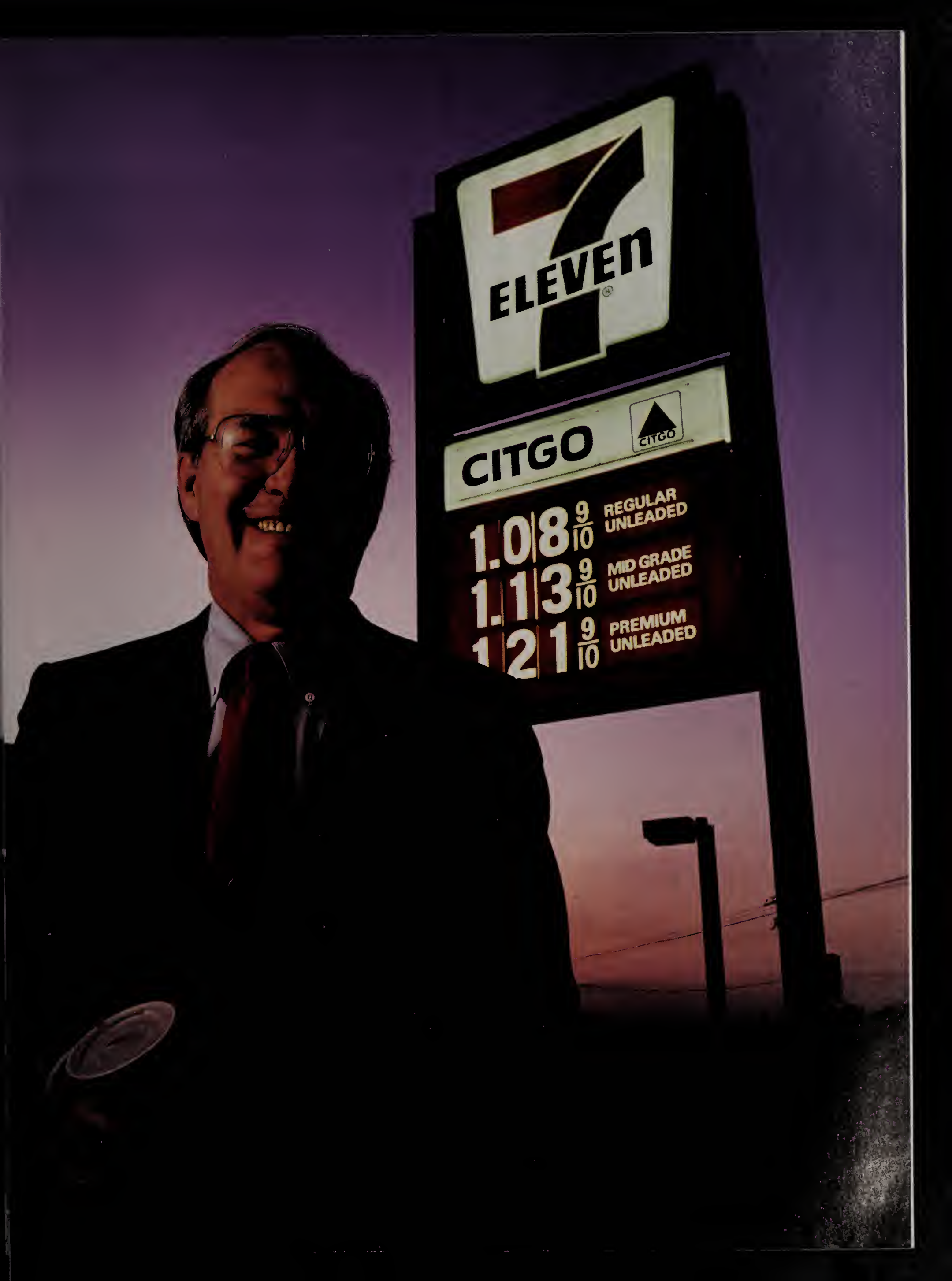
For Southland Corp., the decision to farm out operation of its high-priced data center and communications network was an easy one. The parent company of the 7-Eleven convenience-store chain had undergone a \$4.9 billion leveraged buyout that was announced just before the stock market collapsed in October 1987. Now, early in 1990, Southland executives were scrambling for cash to make payments on the high-yield junk bonds that had financed the LBO. Worse still, construction was just about complete at City Place, an 11-story showplace across the street from corporate headquarters in Dallas. Two floors held the data center; the other nine remained unoccupied. The office rental market was abysmal.

Enter Affiliated Computer Systems (ACS), a start-up computing-services company, not yet in business for a year, with an offer to lease the whole City Place building and run the data center and communications network as well. Southland suddenly had a source of cash and a tenant for close to 400,000 square feet of office space; ACS had its first major customer. Today, according to Lee Marquardt, systems manager for Southland's distribution and food centers, Southland's IS payroll numbers 99 people, mostly dedicated to applications development. More than 70 employees of Southland's 297-member IS department went to work for ACS; the rest left in a series of staff cuts.

Money, too, was the prime motivator for Copperweld Corp., steel fabricators in Pittsburgh. But while Southland backed into the decision as a way to raise cash, Copperweld saw outsourcing as a cost-cutting move. In financial trouble along with the rest of

LEE MARQUARDT: THE POSSIBILITY OF OUTSOURCING "CAUSES A GREAT DEAL OF CONSTERNATION IN THE DATA-PROCESSING ORGANIZATION."





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OUTSOURCING

the U.S. steel industry in the early 1980s, Copperweld first thought of selling its excess computing capacity to recoup some of the cost of an \$8 million MIS operation. It didn't take long to realize that more money would have to be invested before any could be earned—hardly what the financial people had in mind.

If it cost too much to run the IS department, management reasoned, perhaps the answer was to turn the whole department over to someone who could manage it more economically. The someone turned out to be Genix Enterprises Inc., also in Pittsburgh. Barry A. Fink, data processing manager at Copperweld, estimates the savings at about

INCREASINGLY, CIOs who want more time to focus on business issues and strategic planning are taking the initiative in exploring the possibility of outsourcing.

\$4 million a year—half the IS budget.

Outsourcing is not always a response to financial woes, however, nor is money the only stimulus. Some companies seek greater flexibility than their own equipment and staffing patterns can provide; others want to keep up with technological advances without assigning the task to someone on their own payroll. Consolidating the IS shops of newly acquired companies with that of the parent organization can often best be accomplished using someone else's hardware.

Ralph Loftin, a management consultant and principal at Ralph Loftin and Associates in Newton, Mass., sees another reason to consider outsourcing in the growing trend



RALPH LOFTIN: THE COMPANY THAT HAS DEMONSTRATED LOYALTY STANDS THE BEST CHANCE OF GETTING LOYALTY IN RETURN.

PHOTO BY GEORGE SIMIAN

among companies to offload any departmental function in which the workers cannot legitimately aspire to a job in senior management. Citicorp aside, it's almost impossible to name a company whose CEO came out of the DP shop; and a bank, one might argue, is really in the information business anyway.

A night computer-operations manager at a manufacturer has hardly a prayer of reaching the top in that company; the picture changes drastically if the firm moves its data center and staff to an outsourcing vendor.

Some companies decide to farm out IS operations while the department concentrates on moving applications off the mainframe onto distributed platforms. Increasingly, CIOs who want more time to focus on business issues and strategic planning are exploring the possibility of outsourcing.

Not only the data center but also entire business processes are prime candidates for outsourcing. When you think about it, what sense does it make for a company focused on manufacturing tractors, for example, to devote millions of dollars to sending out invoices? If we all stuck to our knitting, this line of reasoning goes, we'd save a bundle. According to Chris Disher, Chicago-based manager of Nolan Norton & Co.'s outsourcing practice, a large DP shop can often take on the workload of a smaller shop for as little as 20 cents on the dollar.

That kind of outsourcing is hardly new. Service bureaus have been handling payrolls since time immemorial, at least as time is measured in the computer industry. And facilities management is hardly an innovation. What is new is the contracting out of some of the less mature functions, such as PC support, data management, and systems analysis and design.

The question facing CIOs now, Disher said, "is not, 'Should I outsource or not?' but rather, 'How should I source my information-technology capability? What pieces should I keep in-house, and which ones should I think about moving outside?'" Disher noted, however, that the potential for outsourcing success seems to be linked to the maturity of the function and to a proven ability to measure its performance.

One key to success is a clear understanding from the start of the in-house organization's performance. For this reason, development of a comprehensive set of measurements is an important step in deciding what, if anything, to



DISHER: "THE JURY IS STILL OUT ON WHETHER YOU CAN REVERSE THE PROCESS."

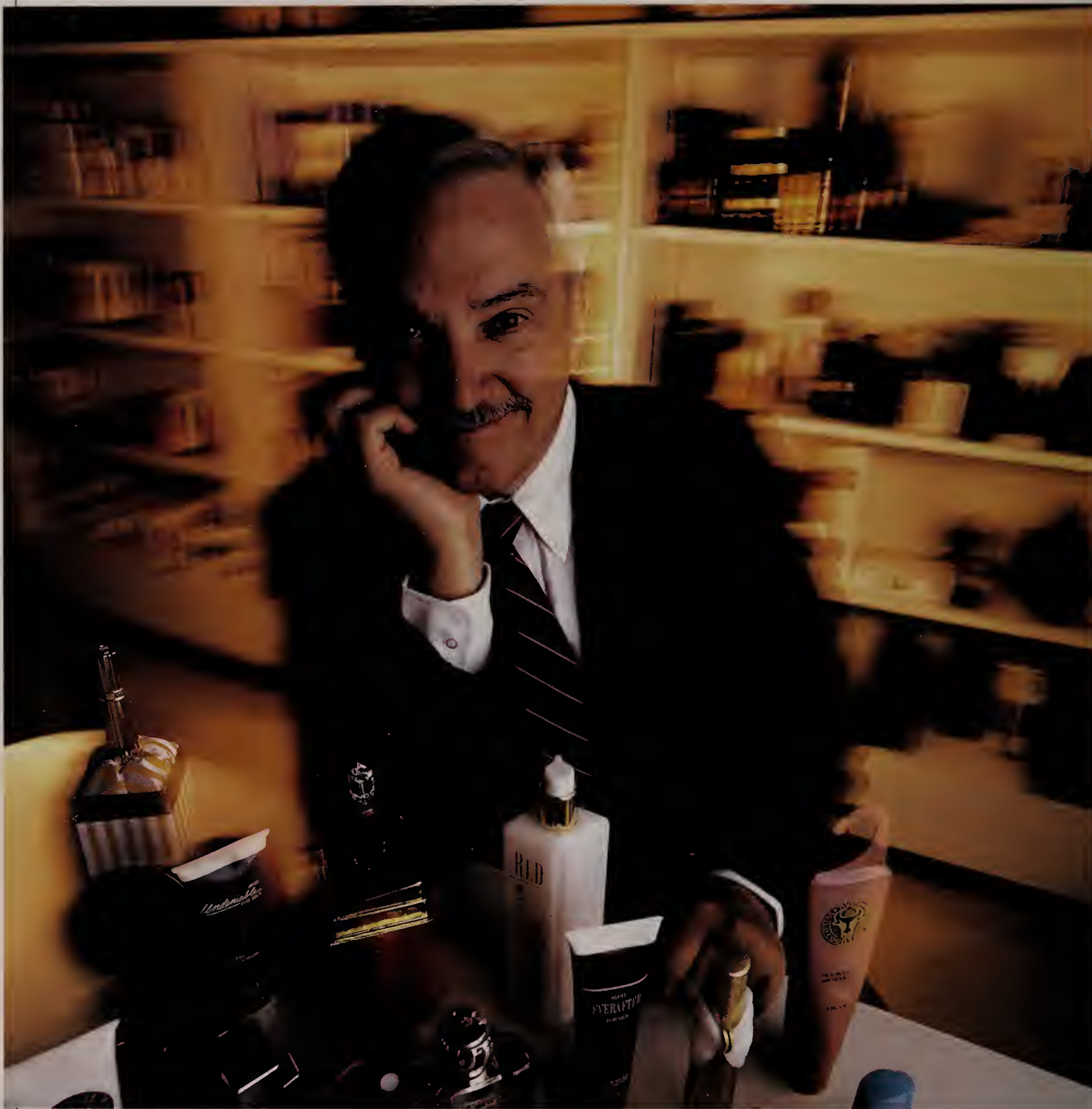
DEVELOPMENT OF a comprehensive set of measurements is an important step in deciding what, if anything, to turn over to an outsourcer.

turn over to an outsourcer. Development-team productivity—measured in function points per work month—is one metric that is growing in popularity. If end-user applications are to be run externally, then actual current response time is a necessary measurement. However, according to Perry Harris, director of management strategies at the Yankee Group in Boston, substantial cost savings may be had if users are willing to accept something less than subsecond response time. An outsourcing study presents users with the relative costs on which to base the choice.

In making an evaluation, data should be gathered on customer satisfaction, the IS organization's ability to deliver applications on time, and the number of errors that need to be fixed after delivery.

Before you issue a request for proposals from outsourcing vendors, you must be able to chart how the demand for computing resources changes over time. Are some times of the day, week or month busier than others? Bidders will need to know. Your company may turn out to be like the 80 percent of Nolan Norton clients who, according to Disher, ultimately decide against outsource-

OUTSOURCING



ing anything. Even so, as Harris noted, the information will prove useful to the IS department in improving performance and managing the relationship with its customers.

At Avon Products Inc. in New York, Raymond S. Perry, vice president and CIO, decided against outsourcing the data center because no vendor could meet his financial criteria. Still, the investigation yielded unanticipated benefits. "We were exploring every

RAYMOND S. PERRY:
"FROM AN ECONOMIC
STANDPOINT, INVESTI-
GATING OUTSOURCING
WAS THE SINGLE MOST
IMPORTANT THING I'VE
DONE IN MY FOUR
YEARS HERE."

way we could think of to save money. We went after computer operations as the most obvious, and what seemed to be the most popular in the press at the time." For outsourcing to be worthwhile, Perry decided, there had to be a benefit on both sides. "If the outsourcer could make a 15 percent profit and I could save 15 percent [of IS expense], then we'd probably get pretty close to a deal," he said. None of the vendors he talked with could come close to that, so the

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OUTSOURCING

The Pitfalls

Some companies may consider outsourcing to be a frightening proposition. But fear itself is only one of the things they need to worry about.

IS executives who have gone the outsourcing route are almost uniformly happy with the arrangement—until you get them to talk off the record. Consider the following anecdotes, all anonymous for reasons that will soon become obvious, as warnings about some of the things that can go wrong.

Contract provisions can be too tight . . .

"We found that there were times when [the outsourcer] was reluctant to do maintenance for fear that we would invoke a penalty charge against them [for failure to meet contractual availability criteria]. In our view of things, the outage was better than the way we were limping along at the time."

. . . or too loose.

"Clients often accept whatever [performance] the vendor offers, as long as it appears to be reasonable. If the vendor is offering 95 percent uptime, or three-seconds-or-less response time 98 percent of the time, they will accept it without looking at

requirements of specific applications. Later, when they realize they are not getting subsecond response time for applications that really need it, they have no contractual protection."

Processing power can be inadequate . . .

"When I worked for [a professional database service], the data center we used was sold to [another vendor]. The new owner took our data off [an IBM] 3081 [mainframe] and put it on a 3083, which has about half the horsepower. Of course it all came to a screeching halt. We were in the midst of attempting to support clients in a very significant research project. It didn't quite put us out of business, but it came very close. The [new owner] either didn't know or didn't care about what would happen. We ended up suing them for fraudulently inducing us to buy their service, but first we made an emergency move over a weekend—we just picked up all the tapes and got out of there.

"It's essential to get the business off the data center before you sue. They've got your operational infrastructure on their computer, and if

they elect not to cooperate, then it's easy for them to perform to the letter of the contract and still leave you unable to do your work. You can't get into a serious dispute with them and expect them not to exercise the leverage that they've got, which is in effect to put you out of business."

. . . or customers can understate their requirements.

"It was a typical deal. The [customer] said, 'This is what we need,' and we agreed to process their financial applications. It turned out that their requirement was about three times the amount of computer time that they said, so it was costing three times as much. We didn't have the capacity to support them, so the deal was just in the ditch—payroll checks not getting out, accounts-payable checks not getting out, that kind of thing."

Vendors can go bankrupt . . .

"We were one of [the data center's] two biggest customers, and [the vendor] was paying off people at [the other customer] to continue processing there. They got caught, and the data center went bankrupt. So we found ourselves in a position where we had to move, literally with the marshals at the door. They had locked up the data center, and we got our lawyers to get them to open the door and let us pick up the tapes and move them."

. . . or change their minds.

"When we signed up with [the outsourcing vendor], they were actively marketing services to the outside, and we were their first major deal. Three months after we went to the data center, they decided that they didn't want to be in the data-center business and stopped marketing their services. About three or four months later, they transferred our account manager to another job, and our service started to deteriorate. Once the guy who was interested in keeping us around was no longer there, they just didn't have a lot of interest in keeping us happy. About six months after that, they traded [an IBM 3092] for an Amdahl, put the ESA operating system on the Amdahl, put our MVS/XA applications up there, and expected it to work. The people in technical support didn't know who we were, or particularly care, so we had some real problems. The whole purpose of outsourcing was to avoid having technicians who were capable of diagnosing those kinds of problems on the staff, so we had no technical resources to isolate the problem."

—M. Williamson





MARIO MORINO: DEALING WITH VENDORS IS MADE MORE DIFFICULT WHEN IS DOES NOT CONTRIBUTE TO THE OUTSOURCING DECISION.

data center remains in Avon's presumably soft and silky hands.

"By the way," Perry continued, "the decision to outsource or not is the second decision you ought to make. The first is whether to evaluate it. In my opinion, everybody ought to do that, because it makes you take a hard look at yourself."

That hard look led Avon to consolidate a number of regional data centers into one central facility, at annual savings of roughly \$3 million. "From an economic standpoint," Perry declared, "investigating outsourcing was the single most important thing I've done in my four years here."

There's another good reason for the CIO to initiate an outsourcing study. Sooner or later, someone is going to think of it, and it's best to keep control over its parameters close at hand. Said Loftin, "When the suggestion for outsourcing comes from outside the IS organization, the IS organization is already one down."

The situation is even worse if the decision to outsource is made by executive or financial management without IS participation. "For a company to do that," said Mario

"WHEN THE suggestion for outsourcing comes from outside the IS organization, the IS organization is already one down."

—Ralph Loftin

Morino, executive vice president at Legent Corp., in Vienna, Va., "there would have to be fairly significant dissatisfaction, and generally with more than cost."

Not only is such a decision a slap in the face for IS, but it also makes dealing with the outsourcing vendor more difficult, Morino said. The only course left for IS is to position itself as the broker of services. "That's generally pretty tough," he said, "because you become the vendor interface point, and it's a very different relationship than it would be if you had initiated the action."

Experts agree that a committee should evaluate the outsourcing option. The committee should be headed by the CIO, with representation from every user organization that will be affected by the decision. The task will probably occupy as much as 80 percent of the CIO's time for three to six months. In that time, the committee will measure the current situation, issue initial requests for information to a variety of vendors, select three or four vendors for further consideration, issue a request for proposals and evaluate the responses.

Handling the human issues is probably the most difficult part of the process. "Obviously it causes a great deal of consternation in the data-processing organization when they hear that outsourcing is being discussed," remarked Southland's Marquardt. Some companies exacerbate the watercooler worrying by trying to keep the discussions secret. "It's naive to think that you can have more than one person know about it and not have everybody know about it," Loftin said.

Inevitably, people will start looking for other jobs, and the best will find them. Copperweld offered financial incentives to employees who stayed on during the selection and move to Genix, Fink recalled. Every IS employee at Southland was guaranteed a job with ACS, according to Marquardt.

The decision to disband key IS functions is nearly irrevocable, experts say. "You're vulnerable," said Disher, "in that you've given up your staff. If you have to rebuild the whole capability, that is a pretty formidable task. The jury is still out on whether you can reverse the process."

"Getting it back is always more difficult than giving it away," Loftin remarked. Reconstituting the data center usually costs "a colossal chunk of money," he added, "so walking away from one vendor will probably mean walking toward another." **CIO**

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OUTSOURCING

THE VENDORS

Choosing an outsourcer, like choosing a spouse, should be more than a cosmetic decision. Relationship-minded CIOs should look closely at compatibility and the potential for a long-term alliance.

BY MICKEY WILLIAMSON

If many CIOs approach the selection of an outsourcing vendor with trepidation, the reason is no mystery. "Choosing the wrong vendor is a significant career-limiting decision," said Perry Harris, director of management strategies at the Yankee Group in Boston. It's not easy to ignore the blandishments of a company that promises to cut your IS costs by 40 percent, but it is important to look behind the economic incentive at what the firm really has to offer.

Swelling the ranks of systems integrators, data-processing service bureaus and contract programming shops, the major hardware manufacturers have also joined the fray. They see outsourcing as a threat to account control and are offering their own services as protection, noted Chris Disher, Chicago-based director of Nolan Norton & Co.'s outsourcing practice.

To win in an increasingly competitive marketplace, would-be outsourcers are finding "clever ways of packaging their solutions," said Harris. Some, for example, seek permission to offer one customer's proprietary applications to their other customers on a royalty basis, offering the code's owners an opportunity to generate revenues without being obligated to support the software. Others suggest operational changes that bring the customer benefits in other areas of the business—minimizing printing and dis-

semination costs, for example, by distributing reports to end users' workstations. "Some of the more aggressive vendors are looking at techniques like that to differentiate their particular service offering from the competition," Harris said.

More than cost-cutting, however, CIOs want "a long-term alliance with an outside organization to provide customized support," Disher said. This means the flexibility to add and delete services over the life of the contract, and a willingness on the part of the vendor to share some of the risk. In the future, outsourcing agreements will be more like a partnership agreement, an arrangement based on mutual trust. Preparing for this kind of relationship, some outsourcing vendors are aligning with specific industries.

Just how much an outsourcer needs to know about your business depends on how much service you want that vendor to provide. Dallas-based Southland Corp., parent company of 7-Eleven, thought it so important that it invited executives from Affiliated Computer Systems (ACS) to familiarize themselves with the convenience-store chain's operations by visiting distribution centers and division offices all around the United States, said Lee Marquardt, systems manager for the distribution and food centers.

Not everyone agrees that this kind of familiarity is crucial to the success of the ar-

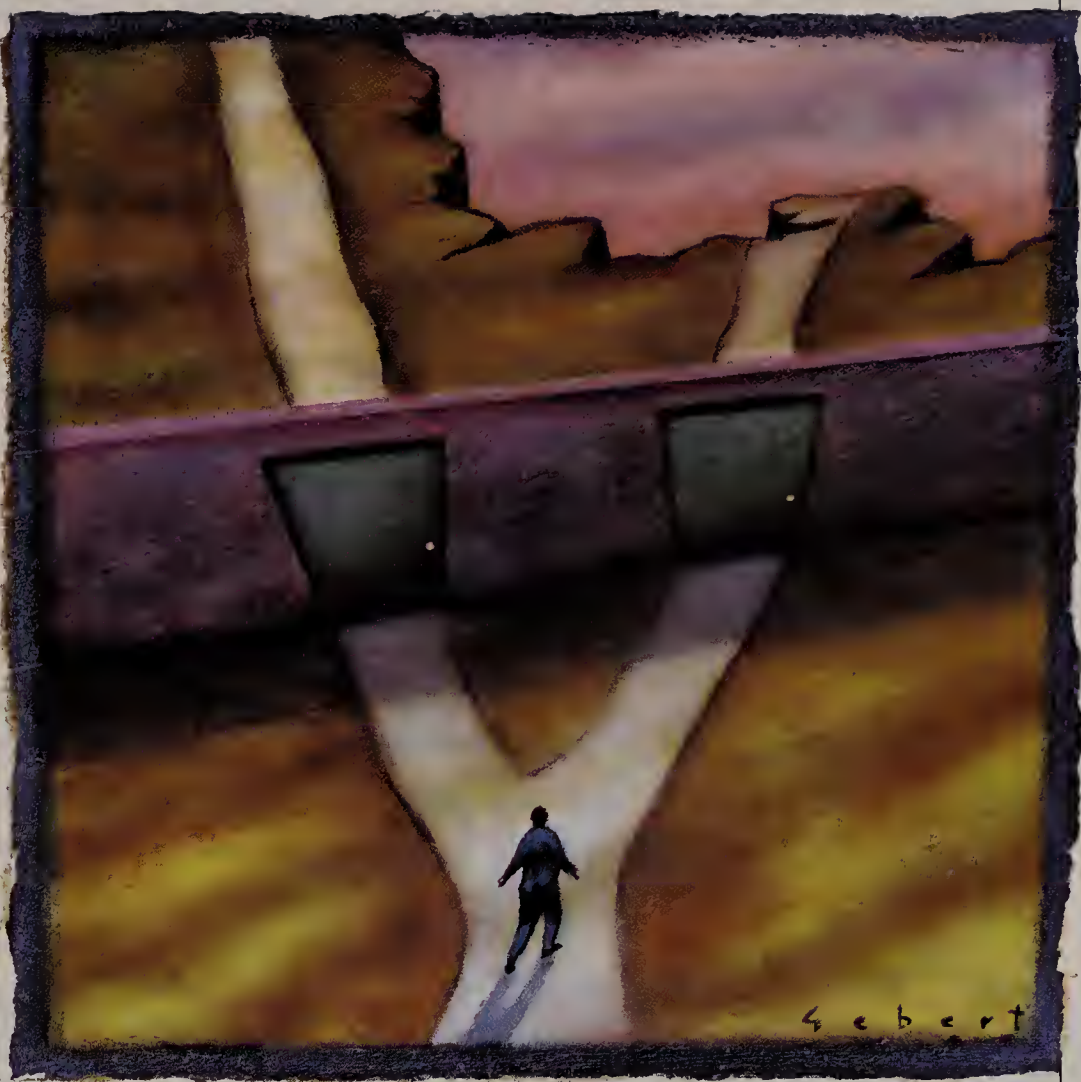
rangement. Barry A. Fink, data processing manager at Copperweld Corp. in Pittsburgh, said that while his company has occasionally sent its account managers at Genix Enterprises on site visits "to get an understanding of our business, I wouldn't say they have a deep understanding, except in terms of our requirements for system availability and that type of thing. As far as an understanding of what makes our business successful and the strategic issues that we're dealing with is concerned, I don't think they need that."

Of course, the closer the outside firm gets to the part of information technology that is strategically important to your company, the more it needs to know about your strategy. Some things about the vendor are important, however, no matter what functions it supplies. You'll want assurance that the vendor has the financial capacity not only to stay in business for the life of your contract, but also to support your applications during that time.

Because of Southland's unusually close relationship with ACS (an 11-story office building and all of Southland's computing equipment is in ACS's hands), the company has the right to a quarterly review of the vendor's books to ensure its financial stability. "I doubt they would have offered us as much access to their books had they not been a start-up," said Marquardt, "and I doubt that their other customers get that kind of information. There's more of a brother-sister relationship between our two organizations than there would be through a normal outsourcing arrangement."

Other vendor characteristics often cited by experts as desirable are a track record of successfully providing similar services to other companies; the ability to support the client's applications and languages for the duration of the contract; backup capacity to handle peak loads and recover from equipment failure; evidence of long-range planning to ensure continued high performance standards as the business grows; a reliable and adequately staffed customer-support organization; minimal requirements to change the client's applications and data-management procedures to fit in with the way the vendor operates; and a willingness to discuss which costs are fixed by contract and which might vary according to usage.

Compatibility in style and culture are important, too, according to Ralph Loftin, of Ralph Loftin and Associates in Newton, Mass. This is especially true where PC sup-



YOU'LL WANT assurance that the vendor has the financial capacity not only to stay in business for the life of your contract, but also to provide ample resources to support your applications during that time.

port or maintenance is involved and the outsourcer will deal directly with end users. "That's an issue that's going to cause a good deal of anxiety for the IS people, who may be protective of their users" as well as less than eager to mediate disputes between users and the vendor, he said.

For Marquardt—who worked for Southland, went to ACS with the outsourcing contract, and then returned to Southland a year later—acting as liaison with the vendor is part of his daily routine. Every morning at 8 he goes across the street to City Place to sit in on ACS's operations department meeting. "It's much easier for me to sit there and relay information [to them]. Plus, I pick up little bits of information that they might not give to me if I wasn't at that meeting."

Copperweld has an operations supervisor who provides liaison with Genix for scheduling. "The most important thing," said Fink, "is to pare down the number of contact points. We've got to be careful that we don't start calling a lot of people over there; we've got to run through the proper channels." Occasionally one of Copperweld's programmers will need to talk with one of Genix's systems programmers, but the question is invariably specific and technical and affects only the application under development.

ILLUSTRATION BY WARREN GEBERT

OUTSOURCING

Making changes to accommodate the outsourcer's procedures is about the most sensitive part of managing the relationship, warned Mario Morino, executive vice president at Legent Corp., in Vienna, Va. Almost invariably there will be new naming conventions that must be explained to the user community, and support must be provided

MAKING changes to accommodate the outsourcer's procedures is the most sensitive part of the relationship.

to implement those changes. The IS department is right in the middle there, and the person in charge of liaison had better know up front and at once what the changes will be and when they must be in place. Similarly, there must be no surprises concerning costs, especially where remote services are charged back to the users. **CIO**

The Contract

A good outsourcing contract should spell out terms for every contingency—including some the CIO might never have considered

Just as good fences make good neighbors (the poet Robert Frost said that), so do good contracts make good outsourcing relationships, experts say. Unfortunately, contracting for services is "an area where most IS people are really impoverished in their knowledge," said Ralph Loftin, a management consultant in Newton, Mass.

"Most of the contracts that they get involved with are either for hard-



ware or maintenance, and the issues you get into in outsourcing require much more sophisticated negotiations and contract management." What's more, he added, corporate lawyers rarely specialize in performance-based contract law.

What follows is a list of issues that should be addressed during negotiations, gleaned

from conversations with outsourcing customers, vendors and consultants.

Pricing: What does the stated price cover? What services and requirements will incur additional charges? When and how often will price structure be reviewed and open to amendment? What third-party license fees are involved, and who will pay them?

Perry Harris, director of management strategies at the Yankee Group in Boston, cautioned against contracts with automatic cost-of-living increases or early-year discounts to be paid back in later years. The former, he said, can make a company unattractive to a prospective buyer. The latter flies in the face of the trend to move applications off the mainframe onto less expensive midrange processors and LANs.

Service and performance: What platform will the applications run on?

What services are covered, and where will they be provided? Will processing be on a shared platform, or on one dedicated to the customer's use? If the latter, who has the right to sell excess processor capacity? What deliverables are included? What performance and availability standards will be maintained, and how will they be measured? How will security, backup and disaster recovery be handled?

Companies need to take a hard look at what response and how much availability they really need. Moreover, metrics should be developed for end-user satisfaction, vendor support and responsiveness, and anything else that the IS organization considers important to its relationship with the business side of the company.

Ownership and control: Who will control technical decisions concerning hardware, software and architecture? To what extent will the customer's applications and data be changed to conform to the vendor's standards? Who has the rights to intellectual property developed during the life of the contract? Who owns the hardware and software acquired to implement the agreement? What are the lines of communication and authority? What must be said about confidentiality and conflict of interest? Is the vendor free to contract with the customer's direct competitors? What happens if the vendor is sold?

While Dallas-based Southland, the parent company of the 7-Eleven chain, and Copperweid, a steel fabricator in Pittsburgh, take opposite positions on the subject of their outsourcer contracting with a competitor, both companies have confidentiality provisions built into their contracts. In essence, either could cancel immediately without penalty if the outsourcer misused the customer's data.

Personnel and other matters: What happens to the IS staff? If the vendor hires them, what about their accumulated benefits? When and under what circumstances can the contract be renegotiated or terminated if the customer is dissatisfied? In case of termination, what must be said about capital assets, the transfer of skills and the need for help from the vendor in moving data and applications to another site?

"It's unreasonable to expect that a company with no prior experience in outsourcing can understand all the implications of a five- or 10-year contract at the beginning," Loftin said. "The ability to try it for a year and then renegotiate is a very desirable feature." —M. Williamson

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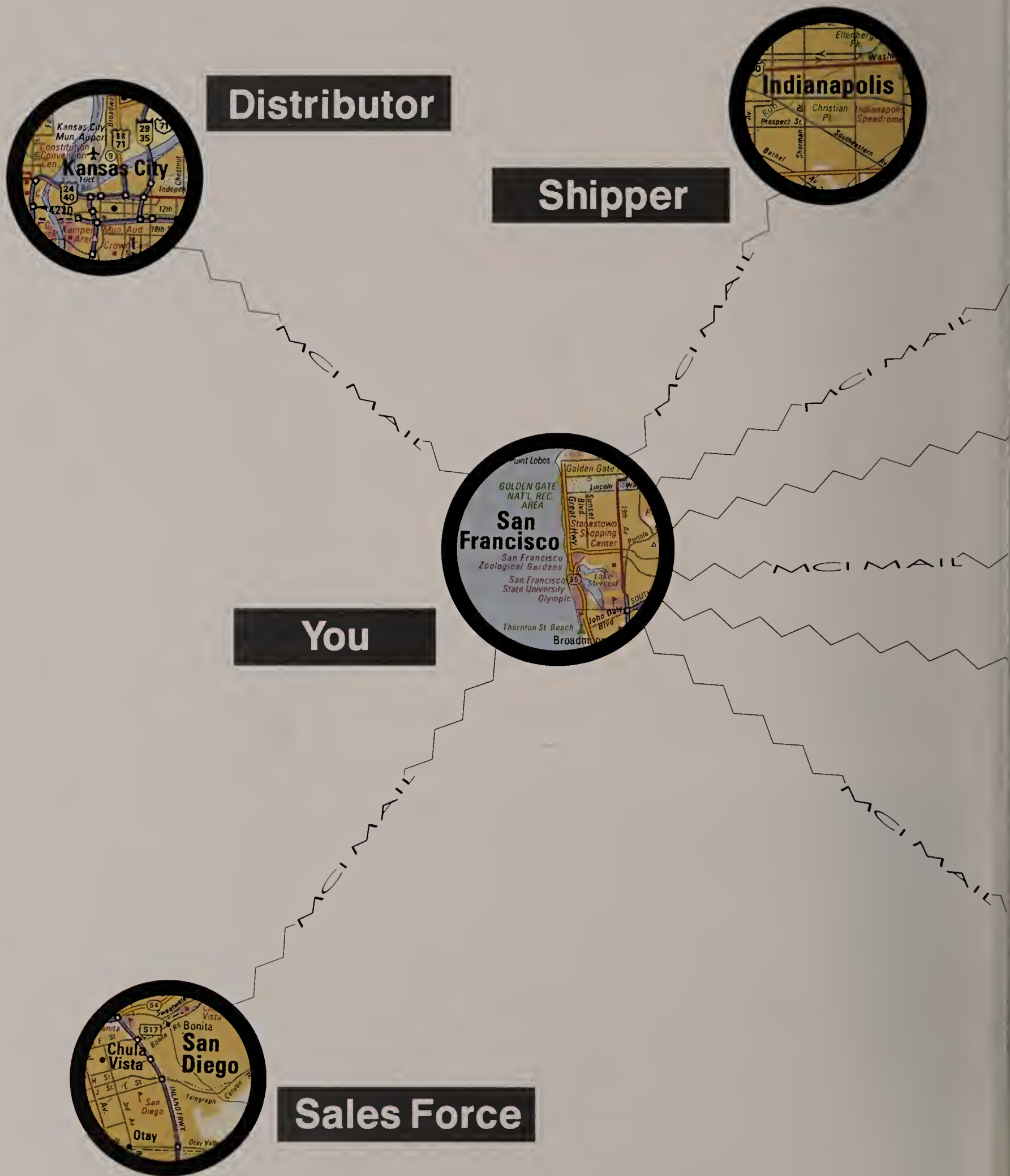
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OUTSOURCING PROFILE

THE SHINING EXAMPLE

For those who embark on it rashly, the road to outsourcing is fraught with perils. H.J. Heinz took a cautious, well-thought-out approach, and everything that could go right did.

BY MICKEY WILLIAMSON

Larly in 1988, concerned about the performance, availability and accuracy of business information despite mounting technology costs, the executive committee of the H.J. Heinz Co. formed a committee of IS executives drawn from its worldwide affiliates. Chartered to improve management of the company's IT investment and to foster resource sharing and technology transfer among the independent business units, the Information Technology Group (ITG) commissioned a study by management consultants at New York-based Coopers & Lybrand.

Among the resulting recommendations was establishment of a central computing service to replace those at Heinz's five North American companies.

Other suggestions involved establishing voice and data networks to serve the entire company, and implementing a disaster-recovery plan. The ITG hired Philip Lichtenfels in October 1988 to implement the recommendations, giving him a five-year senior consultant's contract and a secretary. The two make up the entire IS staff at Heinz world headquarters in Pittsburgh.

Lichtenfels helped the ITG draw up a

comprehensive set of vendor-selection criteria for the data center. He listed them as "cost, technical resources, professional skills, geographic location, quality of data-center resources, customer references, long-term commitment to future developments, willingness to meet contractual requirements and Heinz staff policies, and the capability to help us achieve short- and long-range goals." At the end of a formal RFP process, Genix Enterprises, also in Pittsburgh, was tapped in March 1989.

For safety's sake, Heinz opted to wait until the data center at Genix was running before it sold the company's own computing equipment. "You really have to do it that way," Lichtenfels explained. "The weekend that you make the move you've got to have duplicate resources."

The move itself was something of a logistical masterpiece. "Our objective was to continue business through Friday afternoon and then be back up in business Monday morning," Lichtenfels said. Processing at the various sites shut down at 4 on a Friday afternoon in July. Operators copied all the data and put the copies on an airplane (or a truck; Genix is only eight miles from Heinz USA).

"It all had to be there no later than Sunday morning, so that they could restore ev-



SNAPSHOT

After a comprehensive assessment of its worldwide IT requirements, H.J. Heinz Co. put together a plan to migrate its IS resources—once dispersed among five North American divisions—into a single outsourced operation. One July weekend the changeover occurred. Now Heinz's corporate IS staff consists of two people.

PHILIP LICHTENFELS: "THE WEEKEND THAT YOU MAKE THE MOVE YOU'VE GOT TO HAVE DUPLICATE RESOURCES."

everything and bring the systems back up for business on Monday morning," Lichtenfels said. "We leased a couple of airplanes, used the corporate jets, and we were back in business, transparent to the users, on schedule."

The Genix data center runs all of Heinz's IBM mainframe-based applications, including support for the mutually incompatible MVS/XA and /VSE operating systems. MCI manages the wide-area data-communications network; AT&T has the contract for voice communications, and Comdisco provides facilities for disaster recovery. Heinz retains in-house responsibility for systems planning and applications programming, as well as technical support for distributed processing and local area networks. Run scheduling, distribution of reports and end-user support are also handled locally. Each vendor has a team of specialists assigned as liaison with

the ITG and associated user councils.

The five-year, \$15 million Genix contract contains a clause allowing Heinz to buy its way out after the third year. Other terms include guaranteed levels of availability and technical support; change-management control; the right for Heinz to audit security, backup and confidentiality at will; payment schedules; indemnification and financial liabilities; and the right to approve prospective buyers of the service company.

Although he declined to give exact numbers, Lichtenfels said moving the data center outside did not make much of a dent in the Heinz IS payroll. And the company put considerable thought into managing the human aspects of the transition. "There are a lot of important things to do," Lichtenfels said, "and one of them is to make sure that your people at the remote sites don't walk away from you." **CIO**

PHOTO BY JACK A. WOLF

Motorola's massive commitment to education and training can teach American business a lesson or two about the connection between skilled workers and a successful corporation

BY TAMMI HARBERT



ALMA MOTOROLA

For all the technological progress of the last 30 years, a basic tenet of computer technology has continued to hold true: garbage in, garbage out. And after all the time and effort that companies have spent developing their information systems, many are beginning to look closely at the source of the information that goes in—the company's workforce—and they don't like what they see.

American business is beginning to realize that there are serious shortcomings in the skills of its workforce and that improving those skills will benefit not only the workers but the companies that employ them as well. According to "Building a Better Workforce," a 1988 report from the U.S. departments of Labor, Education and Commerce, "skills deficiencies are costing American business



monetarily, through waste, lost productivity, increased remediation costs, reduced product quality and ultimately a loss in competitiveness."

No company has learned this lesson as well as Motorola Inc., a \$10 billion electronics manufacturer headquartered in Schaumburg, Ill. Motorola began investing in training and education in the early 1980s as part of its drive to improve quality. The company realized that in order to achieve its goal of producing better



and better products, it would have to push its employees toward continuous improvement.

As Bill Wiggernhorn, president of Motorola University and corporate vice president of training and education at Motorola Inc., wrote in the July/August 1990 issue of the *Harvard Business Review*: "All the rules of manufacturing and competition

changed, and in our drive to change with them, we found we had to rewrite the rules of corporate training and education. We learned that line workers had to actually understand their work and their equipment, that senior management had to exemplify and reinforce new methods and skills if they were going to stick, that change had to be continuous and par-

BILL WIGGENHORN (left) and JIM FRASIER in a Motorola robotics training lab. Not surprisingly, technology plays a big role in helping workers apply what they've learned.

PHOTOS BY NEIL MACDONALD

ticipative, and that education—not just instruction—was the only way to make all this occur.”

By the mid-'80s Motorola had discovered that it would need much more than traditional training programs if it wanted to keep pace with this changing climate. For one thing, much of its workforce was illiterate. Line workers who were being asked to calculate results for statistical process-control operations often couldn't handle simple arithmetic like percentages. Factory workers who had always gone by the color of the package because they couldn't read were now being asked to devour complicated textbooks on quality methods. But Wiggenhorn stressed that it was not just factory workers who needed more education. At the executive level, the company was finding that managers were out of touch with such broad technological shifts as the closer integration of product design with manufacturing, and had to be updated on these developments.

These realizations led the company to expand its training budget from \$35 million for a five-year period to \$70 million annually, plus another \$60 million a year in lost work time. They also eventually led the chairman of Motorola to christen the corporation's huge training and education effort with the high-profile moniker Motorola University.

Billions of dollars later, Motorola has made it over the hump of providing remedial education. At the program's peak, Motorola was providing some remedial education to 40 percent of its U.S. manufacturing and support workforce. Today less than 10 percent of Motorola University's efforts are focused on remedial training, said Wiggenhorn. The majority of the workforce is now capable of making good use of the five days of training that each and every Motorola employee will be required to receive each year starting in 1992.

The company has also resolved any doubts about the wisdom of its huge investment. "The majority of the senior managers have seen a payback for highly focused, disciplined

training to help drive certain key strategies," said Wiggenhorn. "By whatever measurement you want to use—on-the-job change, return-on-investment analysis or just feedback from the employees, the evidence is



One of Motorola University's primary goals is to "get the right person in the right program at the right time, and then return that person to an environment in which the skills can be immediately used."

—Bill Wiggenhorn

there that it has made an impact."

Various studies have shown that Motorola gets a return of from \$29 to \$33 on each dollar invested in training. Other studies have shown that the company has been able to reduce cycle time by 50 percent or more for the groups that have had training. Reduced cycle times and quality improvements that translate into fewer defects have allowed the company to avoid costs amounting to \$1.5 million. Although it is impossible to measure how much of that savings is due to better training, Wiggenhorn said that Motorola's educational programs contributed significantly.

More specifically, over a two-year training period at Motorola's cellular-telephone manufacturing facility in Schaumburg, the company saw a 30-to-one reduction in the time between placement of an order and delivery to the customer, a 10-to-one improvement in product reliability, and a five-to-one increase in the levels of em-

ployee productivity that had been predicted for the factory, according to Jim Frasier, manager of retraining programs at Motorola University.

So the question at Motorola is no longer whether to invest in training, noted Wiggenhorn, but rather at what level to sustain that investment and how to make the training more effective.

With an annual budget of \$70 million for 1991, Motorola University employs 200 people full-time and another 400 as contractors. Only 15 to 40 percent of all Motorola's training is provided directly by the university (although the university is in charge of all training funds); the rest occurs either at outside institutions, such as junior colleges, or in the company's business units (where the university provides assistance and coordination). Motorola University also provides training to the company's key suppliers and customers, through speeches by members of its staff and monthly briefings that instruct suppliers in quality techniques.

One of the university's primary goals is to "get the right person in the right program at the right time, and then return that person to an environment in which the skills can be immediately used," said Wiggenhorn. Not surprisingly, technology plays a big role in helping workers apply what they've learned. For example, computer-based training laboratories in Chicago, Schaumburg and Phoenix enable employees to practice their new skills in a simulated factory or engineering facility. In one advanced lab, an engineer can become proficient on the Apollo workstation in one week rather than the six months required previously, according to Frasier. And the portable Program-mable Automation Literacy lab, which teaches workers how to program a single-armed robot, is being used right inside factories.

But computer labs are just the beginning. "The next phase is to expand the use of satellite communication so that with limited intellectual resources we can reach a broader-based population," noted Wiggenhorn.

Motorola is implementing a system that links its labs to an educational satellite-distribution system called NovaNET, run by the University of Illinois. The NovaNET system offers courses ranging from the third-grade level all the way up to the postgraduate level in 150 different subjects. In addition, said Frasier, Motorola can rent space on the NovaNET system to provide proprietary training for particular types of Motorola employees—for instance, product-demonstration training for salespeople.

The satellite-distribution system covers only the United States, but through Motorola's fiber-optic network for data and voice (and eventually video), the company plans to provide NovaNET access to employees in all 30 countries where it operates. Through its peer-to-peer network, which will be connected to the University of Illinois system, Motorola will be able to provide training and education worldwide 24 hours a day. The company is currently demonstrating this capability and will start beta testing the system this year, said Frasier.

This capability will also allow the creation worldwide of what Wiggen-



Providing instantly accessible training globally is a tough nut. In addition to language barriers, there are differences in cultures and values.

horn calls "the intelligent classroom": an interactive and dispersed "classroom" with an instructor who teaches from a company video studio. The students, who can be located in different countries, receive video, voice

and data on their computers. They can also send data and voice back to the instructor. In the ideal system, the training program would be built with embedded "checks" so that at certain points during the lesson, students would automatically be asked to confirm that they understood what had been explained so far. The beauty of the system is that students' responses would be seen only by the instructors. That can be crucial in certain cultures, said Wiggenhorn, where admitting mistakes or a lack of understanding is considered an embarrassment.

Today, Motorola University distributes only about 5 percent of its material via satellite. "But over the next two to three years we are going to try to expand that dramatically in the United States and to provide it outside the United States as well," said Wiggenhorn.

Providing instantly accessible training and education globally will be a tough nut, admitted Wiggenhorn. "Whatever you come out with, you

have to be able to train in 11 languages [and] 13 major cultures across the world, quickly," he said. Complicating matters, different cultures have different values and fields of reference. Some words cannot be translated into certain languages, and examples and illustrations that make sense in the United States mean nothing elsewhere.

"If you are really trying to get people to apply new skills, then you have to make sure that it's designed for them, that it fits their way of learning," said Wiggenhorn. "Which means that we have to learn how they learn."

But having come so far and accomplished so much, Motorola can't stop at the U.S. border. "If you are a multinational and you've done this only for your U.S. population," said Wiggenhorn, "then you haven't done the job of making sure that all employees are trained to be the best." ☐

Tammi Harbert is a freelance writer based in Andover, Mass.

The Motorola Mission

The mission statement of Motorola's training and education organization, which includes Motorola University, lists the following goals:

- ▶ **By the end of 1992**, all employees worldwide will receive the equivalent of five days of job-relevant training per year.
- ▶ **By the end of 1994**, all students in Motorola University training will have mastered and applied the job skills required by the plan for their particular job classification.
- ▶ **By the end of 1995**, Motorola's entire worldwide population will be competent in the language, reading and math skills necessary in their workplaces and prerequisite for higher-level training.
- ▶ **Between 1991 and 1994**, Motorola will achieve a 50 percent per year reduction in designing and delivering new training programs and services.
- ▶ **By 1994**, Motorola University will be a global training community in which roles and responsibilities are clear, nonredundant and supportive of each other in achieving training effectiveness.
- ▶ **By 2000**, exit-level proficiencies of graduates of certain targeted polytechnic institutes, vocational schools and school districts from which Motorola typically recruits will be equal to or higher than the entry-level skill requirements of Motorola.

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The World of Information Technology

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A Bunch of Nobodies

When it comes to running a data center, automation can bring both economy and efficiency. And the ultimate grail of automation is completely unattended operation.

BY LUCIE JUNEAU

An anthropologist sifting through the current literature on data-center automation might conclude that the urge to automate, like the urge to propagate, is becoming key to the survival of the species. According to the laws of natural selection, data-center managers who automate early and well will live to automate another day. Those who don't, and who continue to gobble up expensive human resources like hungry pandas devouring bamboo, will soon find their habitats a little less habitable.

Automation promises to allow managers to stretch their human resources and, at the same time, offer a better product to their users. What's more, by taking people out of the data-processing loop, managers can eliminate many human errors (which an IBM study blames for about 40 percent of system outages).

But many data centers are far from taking advantage of all of the efficiency gains that automation can of-

fer. By most estimates, only about half of all large data centers have made a significant investment in automating common data-center activities.

During regular business hours the lights are still blazing—and the operators still working—at all but a very few data centers, most of those at remote locations. But a growing number of sites are running unattended at night, on weekends and on holidays. The question of whether the data center can eventually operate around the clock without any operators, achieving continuous "lights out," is academic. After all, the goal of achieving unattended operations represents only one route to a greater end: running the center as well as possible for as little as possible.

An unattended operation is one that leaves no human "footprints," running from start to finish without human intervention, according to Arnold Farber, president of Farber/LaChance Inc., of Richmond, Va., a consulting firm specializing in data-center automation. But even though automation products provide alternatives to human intervention for many operations, automation doesn't necessarily lead to staff cuts. Market analysts corroborate reports from vendors that among sites implementing data-center automation packages, layoffs are uncommon. Rather, automation enables companies to check the growth of the data-center payroll and make do with existing staffing levels. Companies that aren't depopulating their centers are using automation tools to make the most of their staff resources so that they can handle the continual influx of new, bigger and more-complex systems more efficiently.

Data-center automation was born around 1975 with products automating standard functions such as simple



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batch-job scheduling. Some of the earliest products included tape-management and restart systems.

Most data-center automation products on the market are designed for IBM MVS operating-system environments, but products to manage the VSE environment, as well as non-IBM and non-mainframe machines, are emerging too.

Automation products are expensive, but on average they reap about a 10 percent return on investment, according to Farber. Prices typically vary according to processor type. Since the mid-1980s, console management has become one of the more sophisticated components of data-center automation, providing one of the highest returns on investment. Automated operator packages, which often incorporate console-management features, undertake many of the functions that are traditionally the purview of console operators.

Today, console messages scroll so fast that no one operator can hope to keep up. An MVS console can re-

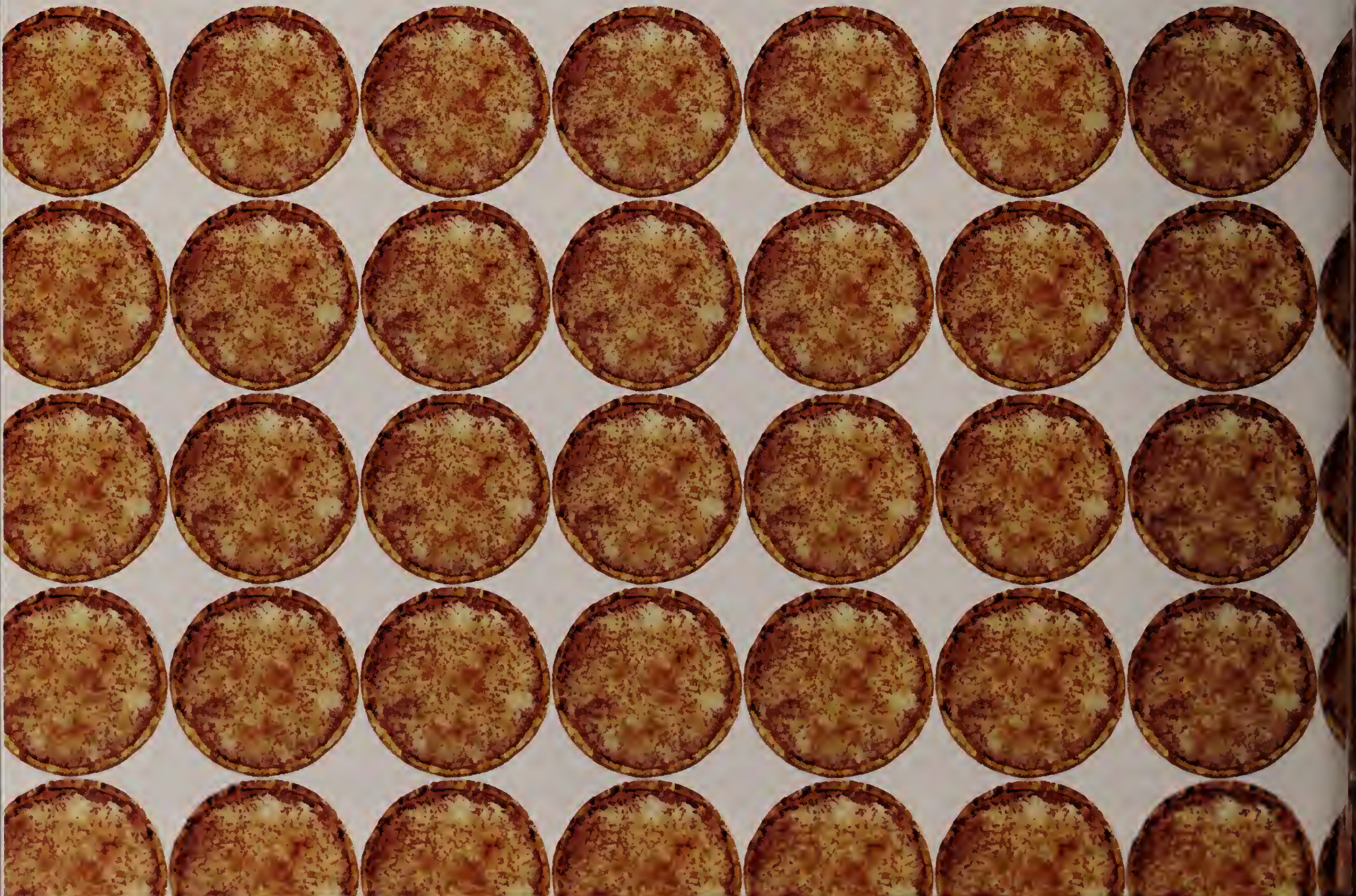
ceive about 10,000 messages an hour, for example. Adding consoles and operators to handle the flood of messages is one solution, but that response is no longer the most efficient.

Automated operators and console managers, such as Goal Systems International Inc.'s OPS/MVS; Candle Corp.'s AF/Operator; Automate/MVC and Automate/XC from Legent Corp.; Computer Associates International Inc.'s CA-Opera; Auto-Operator from Boole & Babbage; 4th Dimension Software Inc.'s Control-O; and Software Engineering of America's ODDS/MVS can reduce message traffic about 50 percent.

Messages that can't be suppressed are either referred to operators or, at the next level of automation, handled by the automated operator. Automated-operations products for DEC systems include Tic Software from Votek Products Ltd., Systemetrics Inc.'s Sentry, and Fenestra Corp.'s Unidocs.

Console management is essential to achieving unattended operations. Today's dial-up packages are capable of contacting operators over the phone to address messages the automated operator can't respond to. In some cases, operators can even use the phone's keypad to enter commands and fix problems from home.

The goal of achieving unattended operations represents only one route to a greater end: running the center as well as possible for as little as possible.



Another data-center automation tool offering a high return on investment is report-management software. Goal Systems' Express Delivery product, for example, a report-distribution package, separates MVS system output into individual reports, adds banner pages with distribution instructions, bundles reports by end user and tracks their distribution. Some systems automatically feed paper into laser printers, burst and stack reports and feed the reports into shrink-wrap machines. Using report-management tools, data centers can control the distribution process so that each user receives only as much of each report as he or she really needs.

Report-distribution packages are frequently accompanied by full-screen viewing options that allow users to look at reports online, saving printing costs. Report-balancing software, another component of report management, conserves printer time, paper and CPU time by helping to ensure that reports that don't bal-

ance correctly won't run through to the end of the print process.

Products to manage tape systems were among the first products on the market, and most data centers are already using tape-management software. The newer offerings, from companies including Storage Technology and Memorex, include robotic library units. Storage Technology's robotic unit, a 12-sided silo capable of housing approximately 6,000 18-track cartridges, can hold 1.2 terabytes of data in what the company calls "nearline" storage. The unit mounts a tape automatically in about 30 seconds, providing much quicker access to data than archival storage. Maintaining data on library tapes, at a cost of less than 50 cents per megabyte, is also much cheaper than keeping data online, which can cost about \$10 per megabyte. Up to 16 of the library storage modules can be interconnected.

Robotic library units can interact with report-management packages so that reports that would typically be

printed or accessed online can be kept in the library where they're readily available to users. Moving the reports off DASD to the less expensive nearline storage can yield big savings.

Environmental-monitoring products are another late addition to the automation product set. The environmental-monitoring component of Systemetrics' Sentry product can alert managers and other appropriate parties (the fire department, for instance) to large and small environmental problems including floods and air-conditioning failures.

A company contemplating an automation project should first make sure it's using its existing products effectively. Products often go underutilized, particularly when staffs are short-handed and too caught up in day-to-day crises to sit down and learn their fine points.

Experts suggest that the biggest, most-obvious data-center problems should be targeted first. After ad-

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addressing the glaring problems (and reaping the greatest returns for the company's investments), the IS executive can start identifying minor operations that automation products might accomplish more efficiently than people.

Data-center automation is a process having more in common with evolution than revolution. Most shops don't start out with a goal of achieving completely unattended operations. Setting lofty goals can lead to disillusionment. It's better to start small and work with short-term schedules and deadlines. Experienced managers suggest working within a time frame of one to three months.

Some shops start by eliminating unnecessary console messages and automating responses to those that require simple reactions. It's a lengthy process. Automation packages aren't like some software products that the staff can install and run within minutes or hours. Most products require written command libraries telling the software how to respond to events that people used to manage.

Since it's easy to get bogged down in the process of writing rules—some programs can have between 1,200 to 1,500 commands—it's important to select a product that staff can work with easily. It may be best to avoid products that require users to write rules in a programming language (typically REXX, IBM's standard applications language). The most popular (although perhaps not the least expensive) products on the market today use 4GLs and provide simple interfaces that allow operators to fill in the blanks as an alternative to writing code.

Mustering support for data-center automation is one of the most important considerations. Since it isn't easy to fund and implement the products, resistance from management, data-center staff or the end-user community can easily derail automation plans.

In traditional organizations where managers' status (as well as raises and promotions) may be based on the number of people who report to them, data-center managers may be lukewarm about projects that promise to keep staff levels down. This is

Most shops don't start out with a goal of achieving completely unattended operations. Setting lofty goals can lead to disillusionment.

something that upper management needs to address. However, some data-center managers say that upper management is often the biggest stumbling block to successful automation. And while much attention has been focused on the need to win data-center staff support, these days, skeletal data-center staffs overwhelmed with work often welcome automation.

Certainly, operators who'll lose their jobs as a result of completing a project can't be expected to dispatch it with any sense of urgency, but most data-center operators don't fear losing their jobs. Some, like many of us, resist change. Not surprisingly, new data centers find it easier to automate their operations than established shops. There are no old habits to break or new procedures to adjust to. In either case, data-center staff should be included in the automation project, and workers' jobs should not be changed without consulting them.

Most sites that now have automation have purchased the components of their package from different vendors, but there are advantages to purchasing all of your automation products from one vendor. For one thing, staff members won't have to tackle a learning curve every time they encounter a new product. However, because vendors excel in different product areas, it's difficult to get the best of everything from one source.

To secure support for purchasing decisions, the IS executive should know what payback to expect from each automation product he or she selects. How much is currently being spent to accomplish operations manually? How long will it be before the product pays for itself?

One way to maintain support at every level is to monitor and publicize the company's automation successes. Experienced data-center managers suggest monitoring the system before automation is up and running in order to have a benchmark to work with. Some automation products can be installed in monitor mode and used to collect the necessary statistics. Later, after working with a product, the "before" picture can be contrasted with the results. Once IS has demonstrated the results of automating a few operations, getting support for subsequent projects will be easier, with other automation successes sure to follow.

Automation packages don't always work well. They aren't intuitive. For example, if one job is conflicting with another and the programmed response is to cancel one of the jobs, the automation product may cancel the wrong one because it doesn't know which is more important. But products are now emerging that can manage complex situations as well as isolated events. Automated performance software from companies such as Candle Corp. uses a knowledge-based approach to problem solving, helping to ensure that the site's equipment will run as well as it can.

In the future, A.I.-based products may be able to observe a system, pinpoint problem areas and figure out how to fix them—all without human intervention. For example, if an automation product repeatedly sees a network line going down, and an operator consistently enters the same commands to fix it, the product will create an application to mimic the operator's actions.

That may not be in the cards this year, but pretty soon, the face of data processing will change for good. When state-of-the-art expert systems and artificial intelligence come together in automation tools that can run on PC platforms, data centers will have more powerful tools to work with. Some mundane chores will always be left for human hands, although I'm sure that somewhere, someone is perfecting a robot to fix paper jams. ☐

Lucie Juneau is a freelance writer and editor living in Salem, Mass.

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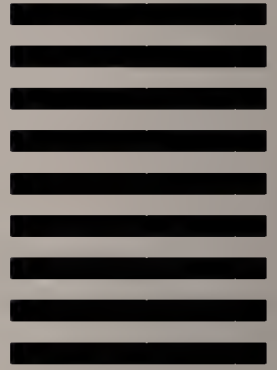
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The Skills Crisis

American business is fiddling while a steady decline in workforce skills threatens to burn away its competitive edge

BY MICHAEL BEHAR

Over 35 million Americans will have to improve their abilities in order to meet the labor needs of the year 2000, according to a report compiled by the prestigious Hudson Institute in Washington in 1987. "Workforce 2000: Work and Workers for the 21st Century" defined the term "skills gap" and made some ominous labor-market predictions. Since then, various macroeconomic studies, projections and anecdotal reports have strongly supported the view that a workplace-skills crisis is brewing. Collectively, in the media and in business and education forums, we talk as if we were in the midst of this crisis. Yet individually, most managers and organizations continue to conduct business as usual, as if there were no crisis at all.

According to the authors of "Workforce 2000," the number of jobs requiring higher levels of skills will continue to grow much faster than those requiring lower skill lev-

els. At the same time, changing demographics and other factors will necessitate that minority workers (including immigrants), among whom serious deficiencies in "foundation skills" are most widespread, fill almost 60 percent of the 21 million new jobs that are expected to be created between 1986 and 2000.

The situation appears even more bleak when these two trends are coupled with observations of our faltering and dysfunctional education system. Consider the following:

- On international tests of educational attainment, American students have a consistent and firm hold on the bottom rankings. (U.S. eighth-graders ranked 16th out of 20 in geometry tests, and the average Japanese student scores higher in advanced math than the top 5 percent of American students.)

- Over 60 percent of all high-school seniors cannot write a basic letter seeking employment, nor can they correctly total a lunch bill or calculate the tip. Moreover, about 25 million adults in the U.S. are functionally illiterate.

- Each year, more than 25 percent of our nation's students (over 1 million) drop out before completing high school. About half of the dropouts enter the workforce.

- Of those students who graduate from high school, about 50 percent go on to college; however, more than 45 percent of the students and adults who enter college drop out before receiving a degree.

- We have no national system of setting high academic standards for non-college-bound students or for certifying their educational preparedness for work.

- We do not foster adult learning—only 15 percent of American workers take courses in any given year compared to 25 percent of Canadian



workers and over 90 percent of Japanese workers.

The "Workforce 2000" report set off alarm bells in corporate corridors around the country. Yet a new study has uncovered a set of puzzling facts. Conducted by the Commission on the Skills of the American Workforce and reported by the National Center on Education and the Economy in Washington, it includes extensive interviews about workplace issues. More than 2,000 individuals—from senior executives to frontline supervisors—were interviewed from over 550 companies. Only a very small minority (5 percent) of those interviewed were concerned about a skills shortage.

The study—entitled "America's Choice: High Skills or Low Wages!"—showed little concern that technology or any other factor would cause major increases in skill requirements. Perhaps this is because new technology can drive work redesign that either raises or lowers job-skill requirements. For instance, a computer can be used to expand the information available to a worker, thus increasing responsibilities, or it can be used to standardize procedures and limit responses, thus decreasing worker responsibilities and the need for judgment.

The choice of which path to take depends largely upon the attitudes and values of those who are responsible for redesigning the work. These attitudes, in turn, are influenced by corporate cultural factors associated with risk and the worth of the individual. The vast majority of businesses surveyed reported plans to automate existing work, but no plans to make major work redesigns.

The authors predicted the continuation of a rough equilibrium between labor-force skills and job requirements—an equilibrium maintained by "de-skilling" jobs more often than "up-skilling" workers.

Comparing the facts and projections in "Workforce 2000" with those in "America's Choice," it is reasonable to ask, "Is there really a crisis in the workplace?" The answer is an emphatic "yes!" In fact, the crisis is deeper than originally envisioned, in-

Unlike work automation, which is based on the familiar and comfortable model of mass production, work redesign presents a painful paradigm shift.

volving our fundamental work processes and our ability to compete in the world market. The great cartoon philosopher, Pogo, said it best: "We have met the enemy and they are us."

Unlike work automation, which is based on the familiar and comfortable model of mass production, work redesign presents a painful paradigm shift. While work automation creates some training and skills challenges, real gains are usually quickly duplicated by competitors. We are not the only country trying to maintain high living standards while competing with low-wage nations. If we opt for work automation, we will undoubtedly perpetuate our slow rate of productivity growth, our growth in real wages will continue to fall behind that of our international trade partners, and jobs will continue to move to low-wage countries while our imports increase and our trade balances worsen.

Work automation is not a viable long-term option. It may not even be a step in the right direction. What is required is work redesign aimed at transforming each corporation into a high-performance work organization. And work redesign, at a minimum, requires that which we do not have today and, given an unchanged educational system, that which we will not have tomorrow: a skilled and literate workforce.

The challenge to create this workforce must be met simultaneously at a national level, with the creation and adoption of new policies and incentives, and at a corporate level, with the fostering of organizational innovation.

"AMERICA 2000: An Education Strategy" describes the President's ideas for the redesign of our public-education system. It calls for developing standards for each of five core subject areas, with a nationwide examination system tied to the standards; determining how one or more electronic networks might be used to improve the quality of education; and developing standards for private-sector skills and "skill certificates." Call 800 USA-LEARN to obtain a copy.

"What Work Requires of Schools: A Scans Report for America 2000" examines the needs of the workplace and whether young people are being prepared to meet those needs. It defines the required skills and proposes acceptable levels of proficiency for them. Call 800 788-SKILLS for a copy.

There are a number of initiatives that companies can take on their own.

- Consider entering into an educational partnership with a nearby university, community college or high school. There are several excellent organizations that can help you get started: Cities in Schools Inc. (703 519-8999); Work, Achievement, Values and Education (WAVE) Inc. (202 484-0103); and the National Academy Foundation (212 754-0040).

- Initiate a departmentwide or companywide examination of education and training policies and programs. These probably evolved on a patchwork basis and may be inconsistent or unresponsive to the needs of adult learners.

- Explore alternatives to classroom-delivered training. Distance learning is one alternative. NovaNET, a national distance-education network, provides lessons in over 150 subject areas. It also offers electronic mail and bulletin boards for communication among instructors, learners and peer tutors. (For more information call 203 254-8066.)

These ideas should be sufficient to get you started. Remember, it is too late in the day to do nothing. Act now; the workplace crisis is real. ☐

Michael Behar is chief executive officer of University Communications Inc. in Westport, Conn.

FYI

The Shell Game

CIOs whose efforts to implement client/server computing have been hampered by kludgy software integration may speed their progress with a new set of modifiable application shells from Quintus Corp. of Palo Alto, Calif. The Quintus WorkPro suite of products facilitates the access, use and management of information across a distributed network via a point-and-click user interface and high-speed data links to servers and networks. The application shells—for software-bug tracking, customer support, telephone messaging, sales-lead tracking and product-repair processing—provide the integration layer that allows companies to take full advantage of existing software and databases. Each Quintus WorkPro application works with a report writer, electronic mail and an activity manager. Process-control commands can be implemented easily in each module to customize it to the needs of the business.

The applications run on high-powered technical workstation lines from Digital Equipment Corp., IBM, MIPS and Sun Microsystems, and are priced at \$25,000 to \$100,000 per application. Quintus can be reached at 415 813-3800.

Easy Does It

It's the simple things that make life worth living; unfortunately, distributed computing isn't one of them. However, a new group of products designed to simplify distributed-application development may offer some solace to despairing IS managers.

The Netwise System from Netwise Inc., is a family of three-tier application-networking products spanning desktops, minis and mainframes. Based on ISO standards, the Netwise System uses code-generation technology and a transport-independent library interface to transparently join applications across diversely configured networks.

According to the company, the Netwise System extends the existing stand-alone program structure to work over a network, thus easing the migration to distributed applications while preserving existing investments in applications and hardware. Furthermore, by providing one interface to the application programmer, the products increase the reliability of applications as they are distributed and eliminate the need to rewrite applications each time the network configuration changes.

The Netwise System works on most operating systems and supports a variety of platforms and architectures including Sun, DEC, CICS/MVS and LU6.2/APPC. For pricing information call 303 442-8280.

Color My World

Nothing in the business world is ever black and white; now business presentations don't have to be either. By combining Proxima Corp.'s new color LCD projection panel with an overhead projector, users can create images in up to 24,389 colors.

The panel, called "Ovation," uses active-matrix technology to display charts, graphs, computer animation and full-motion TV video. The latter is enabled by a video interface, eliminating the need for an add-in computer video card or external adapter boxes.



Ovation also permits the connection of loudspeakers. The sound level from a VCR or other audio source can be adjusted using a hand-held remote. For an interactive presentation, Proxima offers a pointer system called Cyclops, which acts like a cordless mouse. Users can pull down menus, select menu items, click on "hot" buttons and perform other mouse operations directly on the projected image.

Ovation has a suggested retail price of \$8,495. For more information call 619 457-5500.

Speaking Up for the Disabled

A company called Dragon Systems Inc. is breathing some new fire into old ideas about the way people use computers. Thanks to IBM VoiceType, which is based on a Dragon-developed product, the inability to operate a keyboard is no longer a barrier to using PCs. The multimedia speech-recognition product allows users to work with DOS, word-processing, database and spreadsheet applications by dictation.

VoiceType adjusts to each individual's speech patterns and language usage, storing unique pronunciations for future recognition, and includes a 7,000-word active vocabulary that allows for up to 2,000 user-specified words and commands. Developed by IBM's Special Needs Group in conjunction with Dragon Systems, the product runs on IBM's PS/2 and costs \$3,185. For more information call 800 825-5897.





In a courtroom, anything will fly if a scientist testifies to it.

Getting hit by an umbrella causes breast cancer. Environmental pollution causes AIDS. Who proclaims such absurdities? Expert witnesses. One even testified on behalf of a soothsayer who lost her 'powers' after a CAT scan. A jury awarded her a million dollars.

Such quackery, known as junk science, allows 'experts' to present their own idiosyncratic views in court. Where lawyers count on them to support theories ridiculed by serious researchers. According to a July 8th cover story in *Forbes*, this alliance ends up costing consumers and companies billions. While making millions for law firms.

What can be done about such scientific bamboozlement? *Forbes* thinks

American judges should do what European judges do: Appoint their own unbiased experts.

Forbes points out how the mass media has fostered the growth of junk science and tells why it should be junked. It's this kind of gutsy, insightful reporting that brings us far more long-term subscribers than either *Business Week* or *Fortune*. Strong editorial also attracts advertisers. Small wonder that only one magazine, a weekly, carried more ad pages last year than biweekly *Forbes*.

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development, telecommunications, systems software and end-user office systems. Member companies meet to exchange ideas and focus on computer solutions and future product needs. Registration fees: \$295-\$330.

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CONFERENCE CALL

QUESTION: *Do your quality efforts involve using IT to get closer to your customers? If so, how?*

In an age when a company's quality is more often defined by customer satisfaction than by internal measures, businesses are extending their networks to offer customers more information and services.

Vincent L. Morrotti

General manager, information systems, for Mercedes-Benz of North America Inc., in Montvale, N.J., a \$4 billion U.S. importer and distributor of Mercedes-Benz automobiles and spare parts

“Our direct customer is our dealer. There are over 420 franchised Mercedes-Benz automobile dealers in the U.S., and we are responsible to them for the delivery of our vehicles and spare parts, training and service. We [are very aware] that the business plan comes first, and then we marry the technology to the business plan. For instance, we have implemented an electronic parts catalog system at our dealerships. It's a touch-screen system that allows employees to display images of parts. They can get information about a part, such as whether it's in stock, and then go to the next screen to generate an order for it. Even inexperienced personnel can use it. The system is linked to our dealer communications system, called MB-NET. Dealers can also submit their warranty claims-processing directly to us electronically.

“Also, as cars are imported—and prior to distributing [them] to our dealers—we check the quality of the vehicles at one of our five vehicle preparation centers here in

the United States. The vehicles themselves are bar coded. We scan them and send them down a production line. Using an information processing system, we make final inspection and quality checks. Workshop scheduling for modifications is automatically done. All of the vehicles that are designated for immediate sale by our dealers are flagged by the system, and they are the first through the line. Then the vehicles are loaded on carriers and shipped out to our dealers.”

John T. Kohler

Senior vice president of corporate administrative services at Kimberly-Clark Corp. in Dallas

“We're doing several things to allow us to get closer to our [retail] customers and improve the quality of our service. The major thing is that we have a total integration of supply-chain management, from warehousing, complete order cycle and complete production-planning cycle, making extensive use of EDI for the entry of orders. From our major customers we receive point-of-sale data, which allows us to automatically replenish stock. We also perform analysis of POS data and commercially available marketing information to help our customers manage shelf space and stock outs.

“We are also making extensive use of EDI to be more cost effective in the transportation area, including load tendering, freight payment, delivery verification, quality review, automatic routing and auditing freight bills. We keep all the information in a database, which is continually updated. The efficiency comes through the ability to tender a load and then update the database for actual cost.

“The common thread to our customer service is integration. We maintain a complete loop with EDI. It would be possible to provide the same services without integration, but not with the same level of efficiency.”

Alan E. Smit

Vice president, information services division, Blue Cross/Blue Shield of Virginia in Richmond

“One thing we're doing is trying to make use of voice response to provide a more efficient method of getting answers to customers' questions. The issue is trying to balance efficiency for ourselves and our customers. Some people get intimidated talking to a computer and others find it difficult to maneuver through a voice-response application.

“Our customers also include the businesses or groups that get insurance from us. We're looking at EDI to help these customers input membership updates and improve their responses to their employee ranks.

“Another thing we're just

starting to look at is insurance ATMs, more traditionally called kiosks. Subscribers can use them to inquire about benefits or possibly submit claims. We're just starting to investigate where the technology stands and assess the demand for [it] in our market. This is a pretty clear example of the technology being there, but we have to find out if we have a need for it.

“We're also exploring whether we can provide data access to our customers—specifically to groups. We may be able to provide them the data in files or spreadsheets, or allow them to access databases on memberships and claims. We are looking at this as an area where we can improve our service.

“We have multiple customers and each has a different set of needs. The delicate balance is not to lose the human touch while still improving the service.”

Readers are invited to suggest Conference Call questions. Contact Senior Writer Meghan O'Leary at 800 343-4935, ext. 4733, or by fax at 508 872-0618.

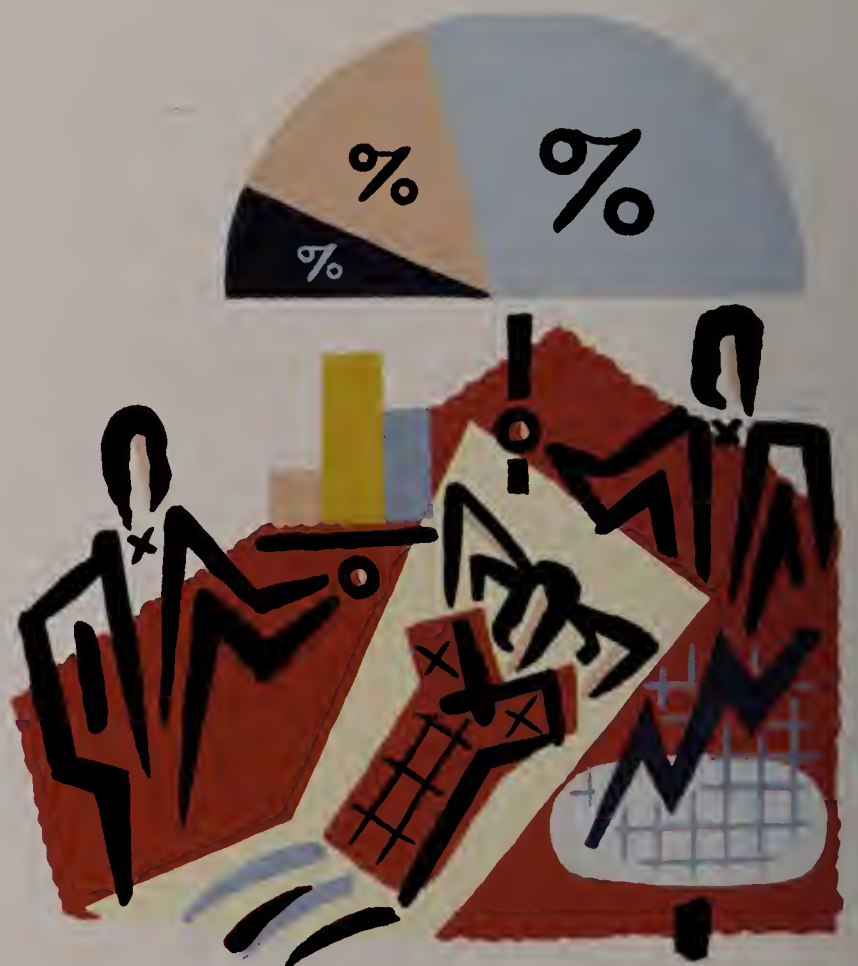


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MAT/COBOL defines the meaning of static analyzer!

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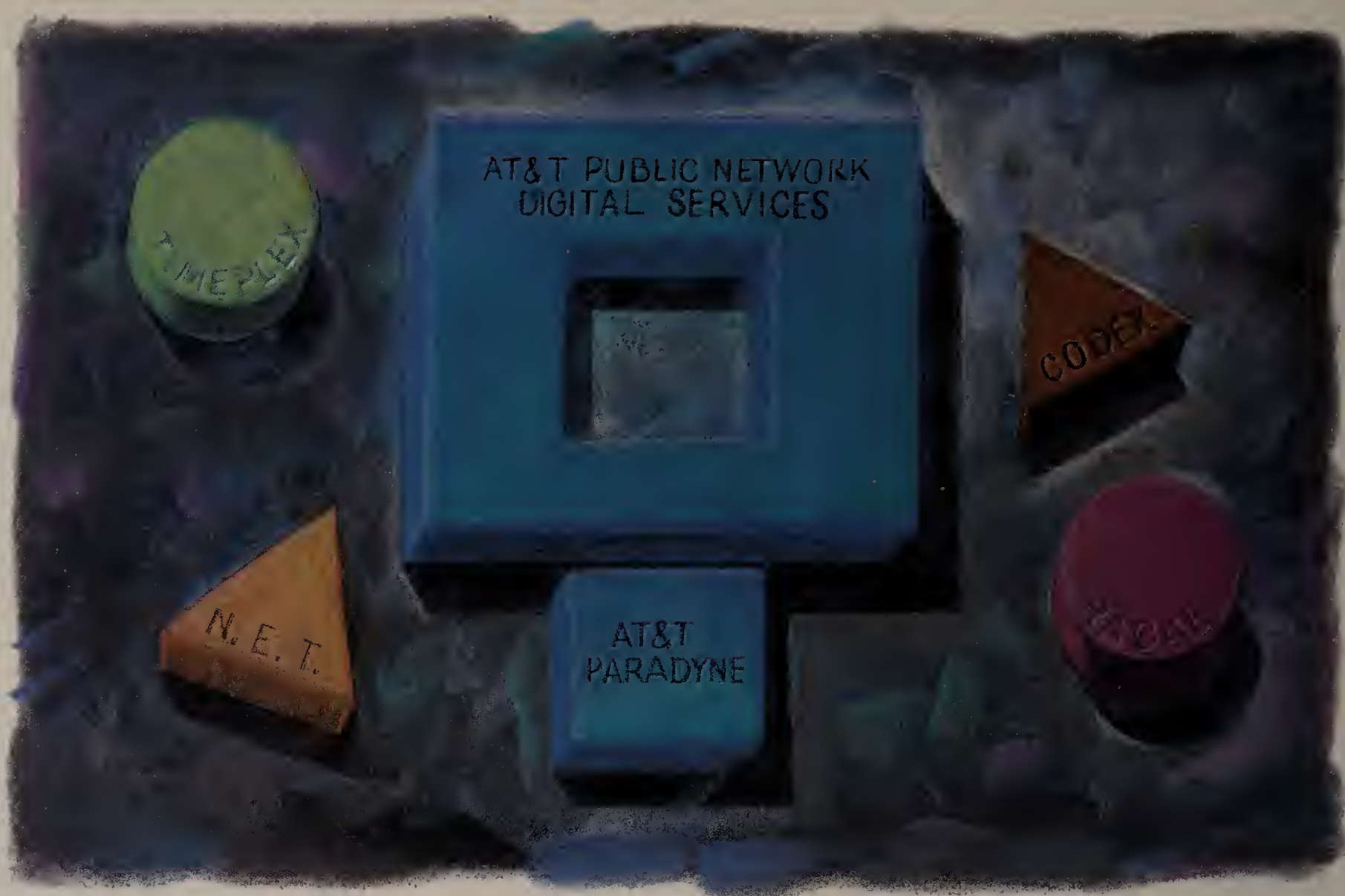
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